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NORMAL VERTEBRATE BEHAVIOR AS A CAUSE OF HUMAN TROUBLE. <i>Richard M. Brickner</i> ...	801
A SHORT HISTORY OF PSYCHOSURGERY. <i>Glenn F. Ramsey</i>	813
A CORRELATION OF LOBOTOMY RESULTS WITH BASIC REACTION TYPES. <i>Olof Johnson and Ruth Ehrenberg</i>	817
TRANSORBITAL LOBOTOMY. THE PROBLEM OF THE THICK ORBITAL PLATE. <i>Walter Freeman</i>	825
THE ORIGINAL CASE MATERIAL OF PSYCHOANALYSIS. <i>Charles E. Goshen</i>	829
AN EVALUATION OF POSTELECTROSHOCK CONFUSION WITH THE REITER APPARATUS. <i>John Summerskill, William Seeman and Donald W. Meals</i>	835
THYROTOXICOSIS FOLLOWING ELECTRIC CONVULSIVE TREATMENT. <i>Nicholas A. Berzel</i>	839
SUCCINYL-CHOLINE-IODIDE AS A MUSCULAR RELAXANT IN ELECTROSHOCK THERAPY. <i>G. Holmberg and S. Thesleff</i>	842
MECHANISM OF SEIZURES INDUCED BY DI-ISOPROPYL FLUOROPHOSPHATE (DFP). <i>William F. Bouzarth and Harold E. Himwich</i>	847
CASE REPORTS:	
Advisability of Undertaking Psychotherapy Against the Will of the Patient. <i>Robert P. Odenwald</i>	856
HISTORICAL NOTE:	
John Conolly and the Introduction of Nonrestraint in Psychiatric Treatment. <i>Edward Podolsky</i>	857
COMMENT:	
Fourth International Congress on Mental Health, 1950. Medical Research Promoted, 860.	
NEWS AND NOTES:	
First International Congress of Neuropathology, 861. Graduate Course in Psychiatry and Neurology, University of California School of Medicine, 861. Patients' Art Exhibited, 861. Research Symposium on Cerebral Palsy, 861. Child Care Unit, Michael Reese Hospital, 862. Placebos, 862. Need for Psychiatric Nurses, 862. American Neurological Association, 862. Society of Biological Psychiatry, 862. American Psychoanalytic Association, 862. Southern Psychiatric Association, 863. Correction, 863. Misprint, 863.	
BOOK REVIEWS:	
The Collected Papers of Adolf Meyer. Volume III: Medical Teaching. <i>Eunice E. Winters, ed.</i>	864
The Integration of Psychiatry and Medicine. <i>William B. Terhune</i>	864
Klinische Psychopathologie. <i>Kurt Schneider</i>	865
Cerebral Circulation in Health and Disease. <i>Carl F. Schmidt</i>	865
La Psycho-Chirurgie des Névroses et des Psychoses. <i>Léonard Singer</i>	866
The Anatomy of the Nervous System. Second edition. <i>Olof Larsell</i>	866
Marriage Is What You Make It. <i>Paul Popenoe</i>	866
General Psychotherapy: Dynamics and Procedures. <i>D. Ewen Cameron</i>	867
A Primer for Psychotherapists. <i>Kenneth Mark Colby</i>	868
Psychotherapeutische Studien. <i>Ernst Kretschmer</i>	869
Leitfaden der Neurologie und Psychiatrie. <i>Wolfram Kurth</i>	869
Prognose und Therapie der Geisteskrankheiten. <i>Max von Müller</i>	869
Masks as Agents of Social Control in Northeast Liberia. <i>George W. Harley</i>	870
The Yearbook of Psychoanalysis. Vol. VI. <i>Sandor Lorand et al., eds.</i>	870
A Study of Epilepsy in its Clinical and Genetic Aspects. <i>Carl Henry Alström</i>	871
Principles of General Psychopathology. <i>Siegfried Fischer</i>	871
Advances in Understanding the Offender. The 1950 Yearbook of National Probation and Parole Association. <i>Marjorie Bell, ed.</i>	872
Social Work Year Book 1951. <i>Margaret B. Hodges, ed.</i>	872
Adventure in Mental Health: Psychiatric Social Work with the Armed Forces in World War II. <i>Henry S. Maas, ed.</i>	872
Air War and Emotional Stress. <i>Irving L. Janis</i>	873
Selection for Parole. <i>Lloyd E. Ohlin</i>	874
Probation and Parole. <i>David Dressler</i>	874
Nutrition and Alcoholism. <i>Roger J. Williams</i>	875
Physical Diagnosis. Fourth Edition. <i>Ralph H. Major</i>	876
Trends in Gerontology. <i>Nathan W. Shock</i>	876
Patterns of Sexual Behavior. <i>Clellan S. Ford and Frank A. Beach</i>	877
Frontal Lobotomy and Affective Behavior: A Neurophysiological Analysis. <i>John F. Fulton</i>	877
Learning Theory and Personality Dynamics. <i>Hobart Mowrer</i>	878
Brain Metabolism and Cerebral Disorders. <i>Harold E. Himwich</i>	878
The Bender Gestalt Test: Quantification and Validity for Adults. <i>Gerald R. Pascal and Barbara Suttell</i>	879
Florence Nightingale. <i>Cecil Woodham-Smith</i>	879

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Therapy for Vascular Headache to Reverse the Physiologic Disturbance

Headache, a problem encountered in all kinds of medical practice, may occur in association with any of a variety of disorders, some organic, others purely functional.

In headaches of organic etiology, e. g. sinusitis, febrile disease, brain abscess — the primary objective is to eliminate the basic disease. Head pain can be relieved temporarily with analgesics, pending diagnosis and definitive treatment.

Functional types of headache present a greater problem, because of the obscure nature of their etiology and their recurrent nature. Among these are:

- Migraine (both classical and variant forms)
- Tension headache
- Psychogenic headache
- Histaminic cephalgia

Wolf and his co-workers established that the pain of these headaches is due to disturbance of the tonus of cranial blood vessels — hence the term *vascular headaches*.

The **craniovascular changes** associated with the several phases of the typical migraine attack are:

Vasoconstriction (Drawing I) — to which the visual prodromata are attributable. It is possible to abort the attack during this phase in all but a few cases. (See treatment below.)

Vasodilatation (Drawing II) — as the vessels lose their tone, exaggerated pulsations set in, resulting in the throbbing pain which characterizes vascular headache. Treatment for the attack is still effective during this phase. (See below.)

Vessel Edema (Drawing III) — if the vasodilatation continues for too long, vessel walls become edematous; this changes the character of the pain to a steady, intense aching. The attack can now no longer be checked, even with maximum dosage of specific drugs. Moreover, sustained headache often induces reflex neck muscle tension, a source of residual pain.

VESSEL STATE

ACCOMPANYING SYMPTOMS

I



PRIMARILY VISUAL DISTURBANCES: SCOTOMAS, HEMI-ANOPSIA, UNILATERAL PARES-THESIA, PHOTOPHOBIA. SPEECH DISORDERS AND MOOD CHANGES. THESE USUALLY LAST FOR A FEW MINUTES TO AN HOUR.

VASOCONSTRICTION

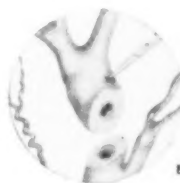
II



AGONIZING PERIODIC HEAD-ACHE USUALLY LIMITED TO TEMPORAL, FRONTAL OR OC-CIPITAL REGIONS. HEADACHE IS THROBBING IN NATURE AND IS RELIEVED SOMEWHAT BY PRESSURE ON COMMON CAROTID ARTERY.

VASODILATATION

III



EDEMA

THE AGONIZING HEADACHE BECOMES DULL AND STEADY. MAY LAST FOR HOURS OR DAYS. NAUSEA, VOMITING, DRY-NESS OF MOUTH, EXCESSIVE SWEATING AND CHILLINESS MAY OCCUR DURING THIS STAGE.

Therapy: For maximum success, treatment must follow two lines:

1. Relieve the acute attack — of the numerous drugs which have been tried, ergotamine and its derivative preparations have proved most effective. The *newest product* is oral tablets of **Cafergot®**, N.N.R. (ergotamine with caffeine 'Sandoz'). When dosage is adjusted to the needs of the individual, Cafergot will give good relief in 85% of cases. It enables a greater number of patients to benefit from early administration since the oral route simplifies treatment as compared to parenteral therapy.

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For.....Date.....

1. Take 2 tablets at first sign of attack.
2. If the attack continues take one additional tablet every half-hour until attack is terminated.
3. Do not take more than 6 tablets for any single attack or more than 10 tablets in any one week.
4. If attack develops more rapidly or is more severe than usual, take 3 or 4 tablets as early as possible.
5. If you notice any change in your symptoms, report to your physician immediately.

M.D.

Do not take tablets between attacks.

2. Reduce the frequency of attacks — psychotherapy and regulation of living habits to avoid fatigue and nervous tension are most effective.

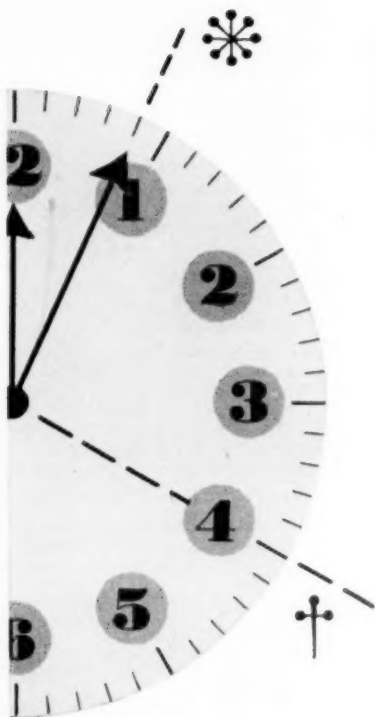
Supplies of Instruction Sheets as shown in facsimile above will gladly be sent on request; reprints of recent reports on Vascular headaches are also available.

GENERAL REFERENCES: DeJong, R.: Chicago M. Soc. Bull. 54: 100, 1951. Friedman, A.: Modern Headache Therapy. St. Louis, C. V. Mosby Co., 1951. Shofstall, C. and Shofstall, W.: J. Kansas M. Soc. 52: 366, 1951. Wolff, H.: Headache and Other Head Pain, New York, Oxford University Press, 1948.

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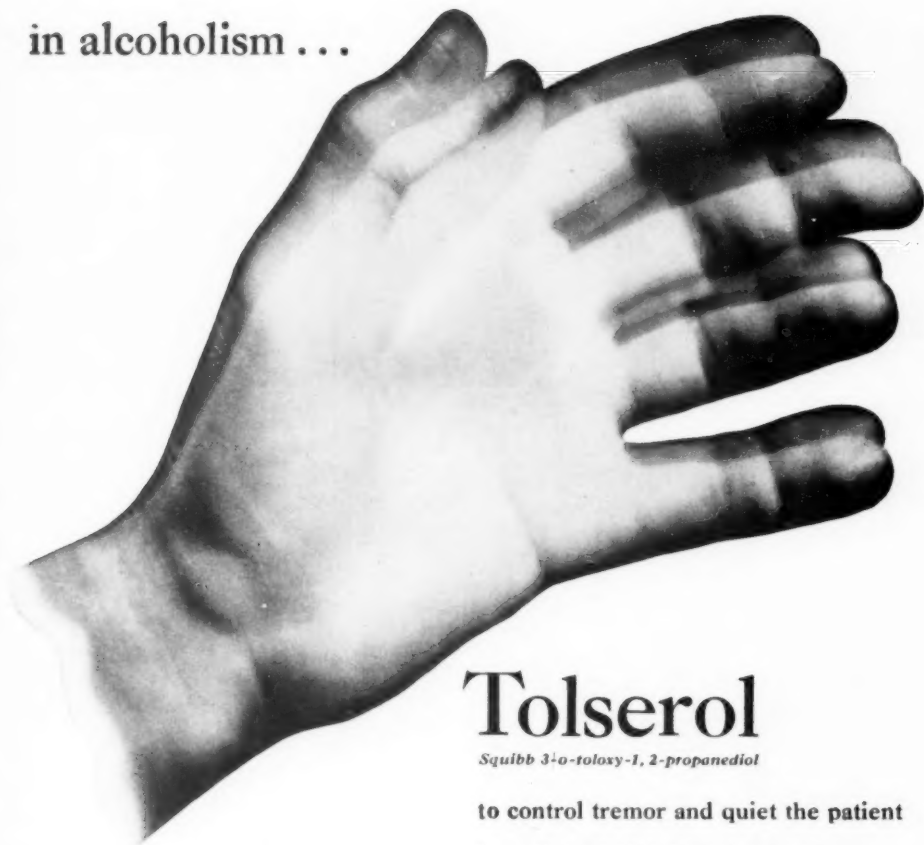
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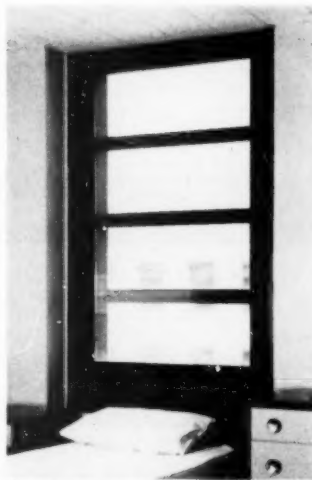
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NORMAL VERTEBRATE BEHAVIOR AS A CAUSE OF HUMAN TROUBLE¹

RICHARD M. BRICKNER, M.D., NEW YORK CITY

One of the major contributions we can make to community interrelations is diagnostic—the recognition not only of sickness, but of the normal forces driving those who influence the course of history. By “normal forces” I mean the most fundamental roots of not alone human but vertebrate behavior. These roots grow into the trees we call politics, economics, and government. And these various fields of human endeavor are quite direct expressions of basic vertebrate behavior. When we examine political or economic activity, we need to be clearer than ever before about the distinction between political and economic data on the one hand, and human behavior on the other.

The hypothesis to be presented states that these normal constituents of vertebrate constitution and behavior are more fully responsible than mental disturbances for human trouble. What I believe these constituents to be, I hope to clarify later. Human trouble includes a wide array of phenomena, ranging from many of the clinical disturbances of individuals to group problems like war.

REEVALUATION OF OUR CONCEPTS OF NORMAL AND ABNORMAL BEHAVIOR

To make use of this hypothesis, we need to reevaluate the clinical material we deal with (the behavior of patients and nonpatients as individuals and in groups). Reexamination is required of all those aspects of our thinking that imply that, without emotional illness, there would be little trouble; that a healthy human is essentially devoid of trouble-making behavior factors. Perhaps we lean in this direction because we are doctors, schooled to treat the sick. Whatever the reason, the attribution of “sickness” to almost all of the psychological difficulties

patients bring to us deprives the word “sick” of any meaning.

Many think of man independently of his evolutionary ancestry; he appears *de novo*; he is inherently “bad” and must save himself or he is inherently “good” and only the “neurotic, abnormal” types of impact by society turn him into the kind of adult we see and have seen generally throughout history. Rage and hostility, for example, are often considered basically abnormal, and only the harmonious side normal. Nothing is left to be explained by man’s inherited vertebrate structure.

Our confusing tendency to regard almost every troublesome behavior manifestation as an abnormality is one cause of our difficulty in defining normal behavior. It leaves practically nothing for the normal category. We speak loosely of abnormality without the standards any other branch of science would insist on. We should employ specific standards of abnormality.

SOME STANDARDS OF ABNORMALITY

1. *Abnormality of Function of the Brain and Other Parts.*—One standard is that of whether the brain itself, or other parts, is working normally. This appears to be the most important criterion: if our standards are to compare with those of medicine in general and would seem basic to any solid comprehension of what constitutes trouble in people, be they patients or not.

In most cases of “psychoneurosis” there is no evidence of abnormality of tissue function, disturbing as the manifestations may be.

2. *Biological Abnormality.*—Homosexuality is biologically abnormal; if every member of a species were wholly homosexual, life in that form would die out.

3. *Statistical Abnormality.*—This exists but the multitude of common, everyday anxieties and conflicts shown by patients seems to be statistically average.

¹ This paper presents a hypothesis. The phrase “according to this hypothesis” will seldom be used, and should be understood.

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4. *Cultural Abnormality*.—A person raised according to the standards of one culture may appear abnormal if he lives in another. For example:

F. L. born and reared in the United States, was 52 when seen because of failure to advance commensurately with his many abilities. F. L.'s father, German-born and reared, had raised his son with conventional German fear of authority. F. L. had emerged chronically fearful, intimidated by those above him in status, able to assert himself only in rage. His general picture might have been normal in Germany, but in the United States it brought him to a psychiatrist. There was nothing to suggest that his brain was abnormal, or was not functioning perfectly as a tissue. In fact, his patterns were just what one would have expected a normal brain to develop under the circumstances. Attribution of sickness to him would seem to be missing the main point.

THE NORMALITY OF TROUBLESOME BEHAVIOR

If our own concepts of psychodynamics are correct, then most troublesome behavior is normal by any of the standards that have any biological or physiological foundation.

Many of the patterns set down in the brains of growing children conflict, and much of the anxiety, frustration, and other disturbance among us is a consequence. Such conflicts, however, should be an expected result of the normal deposition of normal patterns in a normal brain if the patterns are numerous enough.

Yet almost every type of nonstructural trouble we see we call a psychoneurosis. Thus we imply sickness when, according to the present thesis, there is no sickness. The use of the term should be limited to states in which at least one of the standards mentioned above is violated.

Many diagnostic difficulties exist, but they do not invalidate the basic generalization that the normal brain responds to situations by establishing expected patterns that lead to troublesome behavior. For example, some normal-looking clinical conditions may breach standards in a way not detectable by current diagnostic methods. Also, some borderline states cannot be classified now.

Psychoses are plainly abnormalities. We know too little of their origins to identify which standards they breach.

ABNORMAL CONSEQUENCES OF NORMAL BEHAVIOR

The expression of these patterns through various organs may lead to distinct abnormality, either functional or anatomical.

Functional Abnormality.—Hysterical paralysis of an extremity is a conspicuous example of functional abnormality caused by the action of patterns that are themselves supposedly normal.

Vomiting for the ejection of noxious substances is normal physiological behavior. Vomiting to carry out symbolic patterns is normal in its origins—the development of the requisite patterns in a normal brain as a normal expected response to early situations. Such vomiting, however, may lead to a long chain of abnormal events. The subsequent acidosis, if the vomiting becomes chronic, is certainly abnormal.

The use of the genitalia for symbolic purposes may also lead to real abnormalities, such as chronic adult masturbation, which does not perpetuate the species.

Anatomical Abnormality.—Peptic ulcer is an instance of anatomical abnormality supposedly resulting from a normal chain of neural events. Hypertension may be a normal result of certain physical or psychological events; the ultimate cerebral hemorrhage is an abnormal sequel (1).

These pathological states, both functional and anatomical, are usually results, not causes.

SURVIVAL FUNCTIONS AND THEIR CORTICATION

Should the basic theme prove to be much further from the truth than I believe, it would still be worth while to pursue those aspects of trouble that are the result of human normality.

What, then, are the factors in the human brain that make for the disturbances we see around us—in patients, in the population at large, and in large groups? What is the origin of the behavior of individuals, of the prejudices and tensions between groups, of the wars? What makes it possible for leaders—normal or pathological—to get large masses of followers to perform hideous acts?

Here we must bring in the biological, evolutionary background of man, for this is the root of behavior. No one denies this. However, what we have lacked is a concrete bridge between the biological sciences, including evolution and neurology, and the psychological and social sciences, including anthropology, psychology, and psychiatry. The hypothesis offered here, and outlined elsewhere(2), may help to create this.

Let us visualize human behavior in comparison with vertebrate behavior altogether, and mammalian in particular. We see in most if not all the forms the same processes of rage and fear, of attack and defense; of dependence on one another evidently for survival, as in schools or flocks; of some process that draws individuals together harmoniously as in grooming and mating. That is, relationships between individuals throughout the vertebrate chain are characterized in large part by phenomena like these, which will be referred to as functions. Inasmuch as they play so vital a part in surviving the struggle for existence, they are usefully visualized as survival functions.

Human behavior may be broadly visualized as resulting from the cortication of survival functions. To grasp the picture one should imagine an attacking rattlesnake, suddenly endowed with a human cortex. The facilities for such a function made possible by the human cortex are unprecedented for elaborateness. They would necessarily be elaborate, if we are to attribute any evolutionary significance to the human cortex. Our body lacks most of the special adaptations possessed by our predecessors. We lack the lion's strength, the turtle's shell, the antelope's speed. To our cortex must be attributed our capacity to survive the (evolutionary) struggle for existence, not only in primitive times but also now, for the environment—especially that part of it that is human—is still threatening and the Darwinian struggle still great. The cortex probably enabled our bodies to compensate for what they lacked since our beginnings; by now it has given us the equivalent or better of probably every special adaptation possessed by any creature. Hence it is not surprising, but to be expected, that we can express with great

skill those processes necessary for surviving the struggle for existence.

SURVIVAL FUNCTIONS

Some of the processes that may fairly be considered important in surviving the struggle for existence are as follows:

1. *Primary Survival Functions Relating to the Self.*—(A) Behavior of the individual as an entity. Long before there is any detectable apparatus by which an organism can consciously identify itself as an individual entity, it nonetheless behaves as one; ultimately forms evolve in which the individual can consciously identify himself as a self, distinct and separate from every thing else in the universe. Even plants react as individual entities, separate from all other entities, as when they choke off each other's roots, or when a root grows around a rock. (B) The self-evident necessity or importance with which each organism satisfies such needs as eating and mating. It is suggested that as this feeling of importance becomes corticated, and more and more elaborated, there develops a recognition of the importance of the whole self (human ego importance).

These two survival functions serve as a foundation for all the others, which could not be properly manifested without them. An organism could not react to its own hunger without the first; it would not be driven to seek prey without the second.

In human beings we see these two functions, heavily corticated, manifested incessantly, from the care of his life a man takes in crossing the street, through the quest for at least a modicum of prestige, to the pursuit of great power.

2. *Ways of Responding to Other Individual Entities.*—A. Hostile: (a) in rage; (b) by attack, as in killing prey. B. Reactions to hostility: (a) in fear; (b) by defense. C. Nonhostile—perhaps friendly: (a) having harmonious relations as in grooming and in actual physical union by mating; (b) caring for the young by parents; (c) by being dependent upon parents while still young and helpless; (d) by gregariousness, which may be interdependence between members of a group in the interests of actual survival, i.e., by ants, schools of fish, flocks of birds, and human groups.

Some of these functions will be discussed.

Rage and Attack.—These functions are so frequently seen, and are so widely distributed among living forms, as to need no special description.

Of particular importance is the neural apparatus for rage demonstrated especially by Bard (3). The existence of neural machinery for "savage attack" has been shown by Wheatley (4). The neural part of the apparatus has not been demonstrated in all vertebrates, but a fair inference is that all that show rage and attack possess it, and that it is a regular part of the nervous system in those animals, phylogenetically inherited. The recent investigations of Bard and Mountcastle indicate that some parts of the cat's telencephalon act as suppressors of rage, while others may inhibit these suppressors, and may "manage" the expressions of anger (3). Thus, parts of the telencephalon may be anatomical parts of a "rage system" (term is mine) and may represent the anatomical telencephalization of the "rage system." Bard and Mountcastle say (*italics mine*):

The results obtained give some impression of the role played by the neocortex in the cerebral control of angry behavior. . . . the neocortex must normally antagonize the suppressive action of those forebrain structures that are responsible for placidity. This influence may be exerted directly or at some distance "downstream." It is obvious, however, that in the management of expressions of anger the neocortex does more than this. In our cats that became ferocious as a result of bilateral ablations restricted to amygdala and pyriform lobe, rage-reactions could be evoked by stimuli, *e.g.*, visual, that are ineffective in wholly decorticate cats. The effectiveness of such stimulation depends on neocortex.

Forms like the rabbit, which do not seem to exhibit rage, employ fear, defense, and escape. As for attack, they do not attack other animals, but they do attack plants, in order to eat—it is nonetheless attack, whether the subject (prey) is animal or plant.

Relations Between Parent and Young.—A pair of survival functions is embodied in the relationship between parent and young in many vertebrates and mammals especially. It consists of the care given young by parents, and of the dependence of young upon parents not for "emotional" security, but for life itself. Among humans this basic dependence can be corticated in many different

ways, some of them leading to trouble. Likewise the power of the parent can take many varieties of shape, once a human cortex is there to do the shaping.

Love.—Still another survival function may be one that in humans receives the name of "love." Even very early in the evolutionary scale, there is something that keeps animals from wiping each other out entirely, and prevents parents from devouring all their young. It may be nothing positive, but merely an abeyance of other functions.

However, it is fair enough to assume some kind of favoring feeling between at least mating animals. There may be, too, some sort of feeling between members of gregarious packs, especially when they are engaged in joint action. The elephant is said to help a wounded comrade. Dogs show many signs of affection, even toward another form (man).

Again, cortication of such feelings would complicate and elaborate them and their expression. The cortication could be at least a partial explanation of the human experience of love.

Of interest is the apparent truth that the survival functions we have been discussing are not all of the same evolutionary age. The most basic of all, those pertaining to the behavior of the organism as a self (behavior as an entity and self-evident importance of satisfying needs) must be as old as evolution itself. On the other hand, there is no evidence that favorable feeling of any kind between individuals is so ancient; nothing suggests its occurrence in protozoa, elasmobranchs, or teleosts. Birds may possibly show it, and some noncanine mammals like the horse, but its precanine occurrence is doubtful.

3. *Awareness.*—The antiquity of this function is debatable; there is no doubt of its pre-human presence (the dog, for example), and of its progressive development as the brain evolves. The process of awareness itself may develop, or the materials with which it works, or the two may develop *pari passu*, each enhancing the other. In any event, at least in humans, awareness reaches a point at which individuals can be aware of their own specific feelings and ideas. The kind of awareness we try to teach patients we call

insight. The point being made is that awareness is not a new phenomenon appearing for the first time in humans; its elaborate human form, including insight, is, instead, the cortication of a survival function.

TELENCEPHALIZATION

So far the term "cortication" has been used to describe the management of survival functions by man. The biology of human behavior rests on a foundation firmer and broader than is implied by that term, however. Behavior can be visualized in still closer consonance with ordinary neurological concepts, if we think of the cortication of survival functions as part of the fundamental process of telencephalization. A summarized description of telencephalization given elsewhere(2) follows with slight changes:

Encephalization and Telencephalization.—Encephalization is the name for the biological process by which each newly evolved cephalad addition to the brain becomes inextricably involved in, complicates, and dominates the performance of all old parts and functions. The concept of encephalization is an old one, dealt with by many students of neurology. Herrick sums it up in this way (5; see also 8):

During the progress of the elaboration of the head (cephalization) the correlation centers of highest physiological dominance have moved forward from the midbrain (fishes) through the thalamus and corpus striatum (reptiles and birds), to the cerebral cortex (mammals).

Kappers, Huber, and Crosby(6), in reference to this subject, say:

It is evident that in higher forms, and particularly in primates, including man, certain cortical centers assume so necessary and so leading a role in the activities of the individual that such activities are abolished when the appropriate cortical centers are destroyed, evidencing a cortical influence which has developed progressively through the ascending mammalian scale to a point which does not permit of substitution in higher mammals or man.

The work of Fulton and Keller on the evolution of cortical dominance in primates has been widely quoted in this connection. One paragraph in particular from their work illustrates the point they make(7):

It is obviously significant that a cortical lesion in the higher primates resembles spinal "shock"

more closely than in the lower primates, and it serves to illustrate in dramatic fashion the process of encephalization in primate evolution. In man the dominance of the hemispheres is so complete that simultaneous destruction of both foot areas is virtually equivalent, as far as motor power of the lower extremities is concerned, to spinal transection.

With the appearance of recognizable new parts of the brain, we speak of metencephalization, mesencephalization, diencephalization and finally, in reference to the forebrain, telencephalization.

As the evolution of the brain progresses more cells are integrated and participate in each act. Von Economo estimated the number of cells in the human cortex as 13,653,000,000. Probably all are interconnected, directly or indirectly. The possible number of permutations and commutations has not been computed.

By virtue of this vast number of cells and combinations, acts of greater and greater complexity become possible. Simple acts become more elaborate and innumerable multiplications of function occur. Behavior becomes more varied, less stereotyped.

When ventral fins become the legs of amphibians, for instance, increased mesencephalization multiplies the functions of the extremities greatly beyond their limits in fishes. But this advance in complexity is minute compared to the multiplications produced by the human telencephalon by which, for example, walking may become a tool for exploring African jungles, vocal sounds become language, and vision the reading of meanings in the form of words.

The concept of mesencephalization, telencephalization, etc., has always been applied to isolated acts like the use of the limbs. The present and new purpose is to extend it and apply it to the whole systems of parts involved in carrying out such functions as rage, defense, dependence, and the other survival functions. Limb use, for example, is only one small part of the machinery of rage; among the many other parts involved are the parts of the brain pointed to by Bard. Although not identified, the brain stem presumably also contains the apparatus for some other survival functions, such as fear.

This enlargement of the concept makes it possible to visualize in their entirety the

most fundamental processes in the struggle for existence, as dominated and elaborated by the human telencephalon.

We can now restate what was said in terms of cortication; it is by the telencephalization of survival functions that the human compensates for his lack of special bodily parts, and executes so skillfully those functions necessary for survival.

TELENCEPHALIZATION OF SURVIVAL FUNCTIONS AND CIVILIZATION

The principal evolutionary function of the human cortex is to enable us to *express* survival functions adequately. This is quite contrary to the general conception that the function of the cortex is to repress these very processes. Civilization, which is a product of the human brain, is not devoted basically to repression of survival functions, but to their management. Management means *expression* by some modes of behavior and repression by others. It is believed that every culture provides channels for the expression of each survival function(8); expression by one or another variety of conduct is sanctioned and even demanded (*e.g.*, killing in war). Expression in various other ways is indeed suppressed by every culture. The point is that execution of the function is not opposed anywhere (so we believe), but only certain ways of executing it. Examples are given elsewhere(2). Thus civilization everywhere *consists of* the expression of survival functions by some types of conduct, and repression by others.

In addition, in various cultures, some survival functions seem to receive greater emphasis than others. Thus the quantitative balances between expression and repression of the various functions are apparently not the same in all cultures.

Cultures, in teaching the prescribed forms and balances of expression to children, operate via telencephalization. Telencephalization is the neural process by which acculturation works. The survival functions are going to be telencephalized in certain definite ways; cultures provide the ways, and give the form to the telencephalizations. Thus the cortical behavior patterns induced by the culture *are* the actual telencephalizations of survival functions.

A comprehensive illustration is furnished by speech and language. Vocal communication is an ancient survival function, occurring in birds, many mammals, and perhaps some earlier vertebrates. We have reserved the word speech for man, though it might be more correct to save only the term language for ourselves. Each normal human being is born with the cortical apparatus for speech. The next stage is the individual telencephalization of speech according to the dictates of culture. Each culture teaches its new individuals to telencephalize it differently. The different modes of doing this are the languages.

Inherited and Acquired Telencephalization.—The anatomical cortical arrangements for speech are inherited, anatomical telencephalizations; the new structural formations responsible for language are acquired telencephalizations—also anatomical.

The cortex seems to be the only organ in history that can acquire individual patterns—actually anatomical structures—by training; the mesencephalon or diencephalon apparently cannot do it. (Hence we cannot speak of acquired mesencephalization, etc., but only of inherited).

It should be emphasized that acquired telencephalizations become just as anatomically structuralized as inherited ones. This structuralization is the same thing as the formation of engrammes. It could not be better shown than by the example of language. Language is as structuralized as speech. Differential loss of languages in aphasia proves it. Speech and language are only examples: the same is true for the telencephalizations of every function.

APPLICATIONS OF THE HYPOTHESIS

The hypothesis supplies a reasonable evolutionary and neural substructure on which to interpret human behavior. It furnishes a link between evolution and neurology on the one hand, and the psychological and social sciences on the other. It gives a place to the neural factors in human behavior and makes them the substructure of all of it.

Stated in another way, it attempts to give an anchor to the psychological sciences. The study of human psychology has evinced a

free-floating nature, free to float almost anywhere, without any necessary regard for the rest of nature. One of the consequences is our ability to regard human trouble as unrelated to the rest of nature, leaving us free to call it the result of innate good gone wrong, innate evil or sickness. But concepts cannot have substantial meaning when employed out of context and the whole of nature is the context within which the human phase of nature must be read.

All of the foregoing suggests that a fundamental change—really a reversal—is indicated in our approach to the problems of human behavior. The normal vertebrate aspect of most human behavior should be emphasized instead of only what may go wrong with it. If, as we have said, human behavior is basically the normal expression of survival functions according to the dictates of the various cultures and subcultures, then it would be more abnormal not to express them than to do so. It is not uncivilized but civilized to express fear and rage, to attack, and to exercise importance of self by power and authority, if it is done according to code. Repression of the same functions by various other forms of behavior must also be done by code. Assuming the essential correctness of this, we will face our problems realistically not by considering them abnormalities, but by perceiving as their core the fact that we behave like all vertebrates, with unprecedented complexity, skill, and variety.

APPLICATION TO INDIVIDUAL BEHAVIOR

Although this has been considered elsewhere(2) there is one additional point to be discussed.

Shame, if severe enough, can induce withdrawal, impede relationships, and block psychotherapy. It is more easily managed if the emotions responsible for it are seen as natural. For example, the prehuman origin of the sexual function is widely understood but that of rage is not. People may be tremendously ashamed of rage; the evolutionary natural view of rage and its telencephalization may be as helpful in reducing this shame as the comparable idea that "sex is natural."

APPLICATION TO GROUP BEHAVIOR

The point of view described makes for a considerable change in one's attitude toward community affairs.

Inferiority and Superiority of Groups.—It becomes harder to cling to feelings of inferiority and superiority among humans, alone or in groups, when their basic sameness and the sameness of their inherited drives are realized. It becomes easier to develop a vivid recognition that other people are just as real as oneself. Knowing the reality of others promotes interchange of feelings; it helps bring down screens and widen inter-identifications. In a creature with a human brain it is bound to enhance appreciation of the actuality of sorrow and joy of others and promote constructive treatment of others; legalistic, formal ways of viewing humanity are reduced, and realistic, democratic ways aided. Tensions between others, and hence in society altogether, are apt to be reduced, and the chance of open hostility lessened.

The knowledge that specific, demonstrable standards are essential before one can think of superiority or inferiority is also helpful.

Rage and Attack.—The idea that these are abnormalities growing like warts on a congenitally pure skin retards us from handling them successfully. If we recognized them as normal aspects of human behavior, expected and employed by every culture, we would stop trying to deny, exorcise, or "cure" them. Inherited parts and functions are not subject to cure. Only their forms of expression can be changed. Haphazard shifts in the forms of expression should be replaced by shifts arising from insight.

Dependence.—The same is true with dependence. Dependence on parents in mammalian infancy is a survival function; its complete gratification is indispensable. We say that insufficient fulfillment of it breeds "emotional" insecurity, but this is secondary. The feeling of insecurity is a fear of losing life itself. Lasting "emotional" insecurity arising from the undependability of a parent is a telencephalization of the function of dependence.

Many forms of telencephalization of dependence are possible, some of them helpful in later life and some not. The aim has to

be the development of useful forms and not the abolition of the function so as to make the person "self-sustaining."

COMPARISON OF TYPICAL TELENCEPHALIZATIONS OF SURVIVAL FUNCTIONS IN A DEMOCRACY AND A TOTALITARIAN CULTURE.²

One great aim is the translation of neurological and psychological knowledge into social and political terms and vice versa. One test of any hypothesis of human behavior should be its capacity to advance this aim.

American democracy and German totalitarianism will be discussed keeping in mind contrasting forms of typical telencephalization of survival functions, and their social consequences. This could not be done from the standpoint that rage, for example, is pathological, but only if it is considered a universally inherited function, the problem being not its extirpation but the way it is telencephalized.

Rage and Attack.—American democracy furnishes outlets for rage that generally work fairly well. Disturbing as it may be, among our safe outlets for rage are our friends and families. Human gregariousness has many components; we need to depend upon each other for many purposes. We require each other for the exercise of *all* our survival functions, and most of us have people who serve us in these various capacities. It could be said that one of the functions of a friend or mate in a democracy is to serve as a safe target for rage by forgiving it. Home is a place for doing something manifestly impossible in most other places—letting down the hair.

In the German cultural structure (not only in the Hitler dictatorship, but in the Kaiser's and probably much earlier) friends and fam-

ilies could not act as rage forgivers. There were no fit targets, except perhaps one's "inferiors" in the social hierarchy. Germans were afraid of rage or even disagreement among families and friends. Dicks thought this fear was really a fear of killing each other if they once let themselves go. The pattern was to be on terms of prolonged mutual silence after disagreeing. The situation is thought to have arisen in fear of the supreme authority of the typical father, and the consequent repression and storage of hostile feelings. One of the direst consequences is the need to find a sanctioned victim to receive rage and attack, and this may be at least a partial explanation of the savage expressions of hostility to selected minority groups recently in Germany.

The freer, more direct expression of rage typical in the United States tends to reduce its accumulation and to make it a generally less dangerous social force.

It must be admitted also that the expression and receipt of rage are a form of close, even intimate though troubled relationship. Subsequent contrition and its acceptance by the victim are annealing factors. A standard American story is that of strong friendship following a fight. Our modes of handling rage are clumsy, unhappy, and far from a real solution, but they do have uses as a means of managing a troublesome function.

Fear.—In the United States nothing is done to make fear a major factor in the living of life. German culture, on the other hand, had to cultivate it, and we know this to be true of current Russian culture also.

Importance of Self.—The feeling of importance of self is enhanced by certain typical forms of American telencephalization. We speak of it as the intrinsic dignity of the individual. The German concept (and now, it appears, the Russian) of the unimportance of the individual stands in sharp contrast, a matter that, it would seem, must find compensation in some way. That way would imply danger to others, like the sanctioned expression of accumulated rage, when an opportunity appears.

A kind of hoarding of personal importance is practiced in America too. People try to keep others importance-poor in the interest of their own importance. But anyone

² This discussion is drawn from studies of German culture until 1947 (9, 10), and from experience in the United States. No studies on other totalitarian cultures have yet appeared, and my own main experience does not extend to other democracies. The discussion, therefore virtually limited to these two cultures, is not intended as a definitive comparison of all democracies with all totalitarian cultures. It merely reflects some matters we believe to be facts and illustrates an approach to political matters that might be useful if carried out widely enough.

who has observed this matter closely in Germans and Americans must be struck by the difference even in the mere scale of it. In general, Americans also have much greater opportunities to become satisfied about the matter, since their rearing does not force the need for importance to be so pressing.

The idea of a man's uniqueness is of great value in satisfying the need of importance. It may be carried too far; people may feel too readily that they deserve more than they get. Sometimes "uniqueness" is misunderstood to mean that each is unique to the point of having practically nothing in common with anyone else. Some consider themselves unique by virtue of their supposed abnormalities. Some exploit the idea of uniqueness in order to dominate. The truth might be approached more closely by considering people to be almost entirely alike, the uniqueness being there too, but lying within a comparatively small area.

Love.—As a result of these and other processes, peoples' feelings in general tend to spread in all directions in America. The Germans showed a tendency for feelings to be concentrated on the superiors above and the inferiors below one. Typically, Americans apparently feel more feelings and include more people among them; it is proper to feel, and people tend to want to. The restriction of feelings, toward which the Germans who were studied tended, generates suspiciousness and impairs the chances of comprehending others.

German prisoners of war showed a lack of appreciation of the actual reality of others. There was an over-all tendency to estimate others by standard physical characteristics like height and hair and eye color. The ability to identify with others by emotional recognition seemed heavily stunted. The Germans tended to take refuge in restricted, formal rules and regulations instead of the more vivid, broad identifications more typical of Americans. This is important, since it is likely that no solutions to community problems will be achieved until a really wide scope of interidentification and of recognition of the hard reality of others is commonplace in the world. With restriction, rage and attack become all the harder to channel in

helpful directions, and wars are the harder to avoid.

Americans tend to sanction the idea that love is desirable, in contrast to the preachment that love is womanish and weak; they seek and cherish "friendliness"; one often gets the impression that they prize it above everything else. Among German prisoners of war this was certainly not the case. These particular American tendencies make emotional isolationism, group tensions, and wars somewhat easier to resist. The possibility that these factors may sometimes promote too great a need for love in a democracy should be studied.

Dependence.—Among Germans this survival function is typically telencephalized as a supine dependence upon paternal authority. Thus a biological infantile dependence for life itself becomes magnified into a major lifelong pattern. A child reared thus does not dare think for himself nor hold paternally unsanctioned ideas. The function of importance of self is telencephalized by being dwarfed. On becoming a father this child formally dons the mantle of family authority. He can hardly feel his importance securely and must tend to emphasize it constantly before his own children. Thus he helps perpetuate the pattern.

We know little of the regular family structure in other totalitarian cultures, but quite probably the effects on individuals of absolute submission to state authority are like those in German families. Under totalitarianism the chances of developing people who prize the maximal use of the brain are close to nil. Yet humanity depends upon the full use of this organ—it has nothing else to lean on. Safer modes of telencephalizing survival functions can come from no other source. The American and the general democratic usage of the brain would seem to offer the best hope in this respect.

Awareness.—Mead has suggested that Americans are more sensitive than most peoples to the demands of others with whom they happen to be(11). This implies that awareness has received stress and is telencephalized in a considerable variety of ways. There can be no doubt of such variety in general in America in contrast to the situation found among Germans. For many rea-

sons, some of them already given, this matter is of prime importance to our future.

TELENCEPHALIZATION OF THE FUNCTION OF AWARENESS

The function of awareness should receive major stress in the education of children, where it should be used for the development of certain types of insight. Work with patients has proved the value of psychological insight as a pro- instead of antisocial force.

Education of Children.—The idea of developing psychological insight in children during their education is not new, and a number of pioneering and evidently successful attempts have been made and are being developed. Among these are the work of Bullis, which was the first, Force, Ojemann, and Forest Hill Village (12).

Most of the efforts are "practical," designed to equip children with insight helpful in evaluating and dealing with specific types of situations—both in personal life and in respect to society as a whole. This is a large goal, although the proposal to be made here would extend it still further.

Rather than equip children merely with helpful insight, insight should be so infused into their education as to become an intrinsic part of their whole thinking. It should take basic rank in their cortical patterns. It should be their way of telencephalizing survival functions. Ojemann's project attempts exactly this.

Functions like rage and love need less direct emphasis than awareness. By the extension and proper telencephalizing of awareness, children would develop their own ways of telencephalizing the other functions. Their new forms of telencephalization would ultimately constitute new cultural values. Also, the educational program should stress the kind of biological background we have been discussing as even more fundamental than psychological insight.

No contemporary adult could possibly know how the survival functions should be telencephalized. Every adult is "neurally mature"—his telencephalizations or patterns of behavior are quite well fixed; he has to think according to the patterns structuralized in his cortex. These are perforce blinding even in

those with the best mental vision. Hence, no adult really can teach the most socially fruitful telencephalizations. What we can pass on to children is awareness, and material for its content. From there on the future belongs to the growing children. We may hope that, raised on awareness, they may be able to form a safer, presumably more democratic society than we have seen.

Education of Adults.—Consideration of political and social matters from a psychological standpoint is quite a new thing; from a biological standpoint such as that put forth here, it has not even begun. The interested proportion of the population is still extremely small. Most people think and all governments act from ancient political and economic principles, which have still not prevented wars. Politics is a matter of winning, of maintaining prestige, of outwitting, of dealings usually in the interest of a special goal. In transactions with foreign governments, the basic solution of problems may have to be sacrificed to the effort of each side to gain advantages. In government no less than in private life, the formal subject of a debate is likely to be a mere rationalization of the built-in behavioral patterns of the debaters. What may really be under debate in a parliament is not a tariff, but whether "my father can lick your father." Dealings with foreign cultures are based on homemade telencephalizations, which offer little opportunity to see the situation as the foreigner sees it even if it should be advantageous to the home government to do so; the foreigner in turn must view it through his own homemade patterns.

While there is no chance of completely achieving new and sounder cultural and therefore political values through enhancing the awareness of adults, it can still help people to deal with problems like hostility as they affect society. Adult courses have been given and might be given on a wider scale, and in various nations, with the aim of improving biological and psychological insight, having in mind especially the application of this awareness to social problems (2) like those mentioned in the following paragraphs.

An example is the matter of teaching Germans about war guilt. One of our postwar aims was to get the German people to per-

ceive their own war guilt; this was to be an educational democracy-promoting experience. The concept was foreign to most Germans, as it would have to be. They simply did not know what we meant. Their telencephalizations did not include the manifestations of importance of self by participating in national thinking, let alone policy determining. Dependence had been overweighted, and Germans were patterned to follow the leader. Even Goering, when arrested, uttered the familiar phrase "Ich bin ein kleiner Mann" (I am a little man) (13). The Germans were no more "guilty" than they were "guilty" of not speaking French. They were acting out their telencephalization patterns like anybody else.

If the Germans were to change so as to be sure not to attack the rest of the world again, their whole telencephalization setup would need change. In particular, the function of dependence and importance of self would have to be telencephalized so that adults could emerge, not afraid of authority but feeling equal to it, and expecting to voice their feelings and thoughts. Then they could participate in the running of the community and could hold themselves responsible for it.

A widespread grasp and utilization of behavioral insight in approaching all these questions would be an advance. It could lead to better understanding of our goals and those of other nations, and of the motivations of ourselves and our leaders. It could turn people toward the seeking of solutions instead of advantages. It would at least be something sound and new, worth trying in the face of the timeless failures of the old methods.

RECOGNITION OF SOCIALLY HARMFUL BEHAVIOR PATTERNS

It has always been difficult to grasp the idea that a culture itself could have dangerous trends; such trends have usually been considered evidence of mental illness. One cannot, however, readily attribute mental illness, like measles, to a whole group. Once free from the necessity of attributing abnormality or illness to any disturbing behavior pattern we see, we can identify socially dangerous patterns as shown by groups much more clearly; it becomes easier to see

how a group, and not just its leader, manifests trends, and how people may even seek a leader who will help them express their habitual trends.

Projection.—Projection may be a matter of importance in international relations. The Germans under Hitler seem to have made great use of it, accusing others of what they themselves had done or were about to do. This "justified" their own action. Whether or not it was real projection or a deliberate method or both was never learned. The study of projection might enlighten people about the prospective actions of any enemy, and also about the motivations of their domestic politicians at times.

Paranoid Reactions in Groups.—Evidently paranoid patterns of feeling and reaction can appear in groups (14). In the name of a cause, groups can evoke in one another paranoid states of mind. The mere existence of an action group pits it against other groups. Suspiciousness; feelings of being threatened with attack, often probably projected; inflated feelings of the group's importance; sense of mission, sometimes with devout self-dedication—all seem rather easily aroused, perhaps transiently, in part or all of an action group. Sometimes antecedent paranoid patterns and group activities may interplay, the group serving as outlet for the patterns.

There are cultures in which the paranoid type of behavior seems to be a desideratum. Benedict described this in relation to the Kwakiutls (15), and I wrote of it in relation to the German culture, partly in association with L. V. Lyons (16).

Some people thought I had meant that Germans were psychotic; they were grossly wrong. My thesis did not include the idea that any Germans were psychotic. A culture can elicit from its members a wide variety of telencephalization patterns, and the paranoid pattern seemed to be one of the possibilities. I thought of it as a normal, though dangerous, pattern of response that had become one of the regularities in German cultural behavior at least since the Kaiser's time. The Kwakiutls made it "the essential attribute of ideal man" (15).

The point is that we should watch for such group reactions, and not smudge their recognition by confusing them with non-

existent group psychoses. When they can be accurately recognized in important groups, our job is to make the issue clear. The public might then stand a better chance of evaluating the purposes and behavior of the group, and to distinguish data from the living-out of paranoid drives. Paranoid patterns are only a special instance of a general subject, but are notable because they are especially dangerous.

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A SHORT HISTORY OF PSYCHOSURGERY

GLENN V. RAMSEY, D. Ed., MADISON, N. J.

Probably the precursor of modern psychosurgery can be traced back to the dawn of civilization when holes were cut or burned in the skull of a "possessed" person, in order that the evil spirits within could escape. The first psychosurgical operations for relief of mental disturbances were probably performed over 2,000 years ago by the Peruvian Indians of South America(4). Apparently there has existed since primitive times a belief among mankind that "unnatural" ideas and "bizarre" behavior were in some way related to the conditions inside the head of the individual. Modern thinking regarding psychosurgery, however, probably started early in the nineteenth century with the ideas of Gall and his student Spurzheim, who forwarded the beliefs that each mental disorder had a "seat" or was "localized" somewhere in the brain. Neither Gall nor Spurzheim was ever able to provide any acceptable evidence to support this idea.

A pioneer in psychosurgery was Gottlieb Burckhardt, a Swiss surgeon who in 1890 performed the first destructive operation on an otherwise intact brain in hopes of relieving mental symptoms(1). His thinking regarding the operation is reflected in his statement, "If we could remove the existing impulses from the brain mechanism, the patient might be transformed from a disturbed to a quiet dement." In all, Burckhardt operated on 6 psychotic patients, making an incision in only one of the frontal lobes. He reported that only one of the patients improved, one died, and the other 4 showed no improvement. Burckhardt was impressed with the possibilities of the technique but discontinued his work because of the professional and lay opposition to such an operation. At this time the ill-founded philosophical concept that the brain was a holy-of-holies and should always be preserved dominated thinking. Burckhardt was too advanced for his epoch.

Possibly the next surgeon to use psychosurgery in an effort to relieve mental disorders was the Russian, Puusepp. In 1910 he operated upon 3 manic-depressive psy-

chotics by severing unilaterally some of the connections between the parietal and frontal lobes(26). Like Burckhardt, he also reported unfavorable results. The failure of the Burckhardt and Puusepp experiments might be attributed to use of unilateral incisions, selection of patients with unfavorable prognosis, or poorly located incisions.

Moniz.—A period of 50 years elapsed from the time of Burckhardt's first psychosurgical operation until the procedure was started on its present-day use and development. In November 1935 Egas Moniz, a Portuguese neuropsychiatrist, ordered the first series of psychosurgical operations for the relief of distressing mental symptoms, which proved successful(19). For several years before the operation he had been considering the use of psychosurgery as a possible method for the treatment of severe mental disorders. He had been influenced in his thinking by reports made on the behavior of patients with frontal lobe lesions and the postoperative accounts of the behavior of patients after the removal of tumors in the forepart of the brain. Apparently the report made by Fulton and Jacobsen(14) on the behavior of 2 chimpanzees after lobotomy was the final bit of evidence that convinced Moniz that psychosurgery should be attempted on human subjects in hope of relieving mental disorders. He offered as a rationale for the operation the belief that in certain mental disorders the functioning of cortical tissues became fixed instead of free and interchangeable. He felt that the severance of certain parts of the brain would break up these groupings of neuron patterns.

The psychosurgical operations that Moniz recommended were performed with the help of his associate, Almeida Lima(20). The operation involved the making of an opening in the skull on either side and then cutting from 4 to 6 cores at various subcortical levels in each frontal lobe. In 1936 he reported successful results for his first 20 patients. In this report he states that all 20 patients survived the operation, 7 were considered recovered, and another 7 improved. Today the

use of the Moniz operative technique has largely been abandoned in favor of more extensive severances of the white matter. However, the first successful work of Moniz stands as a great event in the history of the treatment of nervous and mental disorders. Moniz shared the 1949 Nobel Prize in Medicine for his pioneer work in psychosurgery.

Freeman and Watts.—In the United States Freeman and Watts had been following closely the work of Moniz and when the report of his success was received they immediately began to use the psychosurgical technique. On September 14, 1936, the year after Moniz performed his first psychosurgical operation, Freeman and Watts carried out the first lobotomy operation ever done in the United States(7). Since that date, Freeman and Watts have continued to be two of the most ardent proponents and developers of psychosurgery. They have developed a modification of the Moniz operation which they have designated as the *precision method*. This procedure involves the careful study of landmarks of the skull so that a more precise severance of predetermined areas of the frontal lobes can be achieved. By 1950 they had employed psychosurgery in the treatment of over 1,000 patients. They have assiduously kept track of almost all of the patients they have operated upon, and have made periodic reports on the results(8, 11, 12). In 1942 and again in 1950 they published a technical book on psychosurgery that summarized their own work and traced the general developments in the field(9, 10).

Transorbital Technique.—In 1946 Freeman(6) introduced into this country the modification known as *transorbital technique*, which was originally developed by Fiamberti in 1937(5). All lobotomies performed in the United States before 1946 involved entering the brain through burr holes made in the skull. The transorbital procedure calls for entering of the frontal lobes through the bony cavity above the eye, and then severing the fibers in the lower frontal lobes. This method is safer and faster than the lobotomy procedure and is followed by fewer unwanted complications. The operation involves less destruction of brain matter than lobotomy and is recommended by its proponents for patients with less malignant

types of disorders. The number of cases submitted to transorbital technique has increased each year since it was introduced. Critical long-term evaluations of the results of this technique are awaited.

Lyerly "Open" Operation.—One of the first modifications in the traditional lobotomy procedure was the "open" operation developed in 1937 by Lyerly(17). The main contribution of the Lyerly technique is that the incision is made under clear visualization, as use is made of a lighted speculum. Previously all operations involved a "blind" incision. Those who use the Lyerly modification claim that it lessens the chances of severing arteries, and therefore is a safer operative technique. Today in the United States the Lyerly "open" operation is the most frequently employed type of psychosurgical procedure.

Ablations.—The psychosurgery performed by Moniz, and Freeman and Watts, involved primarily the severance of brain tissues. It was not long thereafter before surgical removal or ablation of parts of the brain was introduced as a psychosurgical technique. The surgical removal of diseased or injured brain tissue had been done for many years, but the deliberate removal of brain tissue from an intact brain solely for psychosurgical reasons had not been attempted before 1936. In that year Ody, influenced by Cushing's report of relief of mental symptoms following the removal of frontal lobe tumors, decided to use an ablation technique as a psychosurgical procedure. He removed parts of the frontal lobes in several patients and found the procedure only moderately successful(22). The surgical removal of portions of the frontal lobes is known as *lobectomy*.

For several years before 1948 Penfield had employed a *gyrectomy* operation for relief of traumatic epilepsy. This procedure involves the removal of selected parts of the frontal cortex. In 1948 he employed the gyrectomy operation in the treatment of mental disorders(24). This type of psychosurgery calls for the removal of brain tissue by cutting along fissure lines whenever possible in order to leave behind gyri capable of normal functioning. Results to date do not support the continued use of gyrectomy, at least in its present form.

One of the most comprehensive research studies ever done in the field of psychosurgery was the 1948-1949 Columbia-Greystone project. The operative procedure employed in this investigation was called *topectomy*. This term refers to the careful plotting and removal of small amounts of grey matter in the frontal cortex. This careful selective ablation was done so that correlations could be made between the discrete parts removed and specific items taken from data obtained by pre- and postoperative examinations and testing of each patient. The purpose of this study was to seek relationships between the parts of the brain removed and changes resulting in behavior. The Columbia-Greystone findings are some of the most significant yet obtained in research on psychosurgery. An account of the project and results obtained are presented in the book, *Selective Partial Ablations of the Frontal Cortex* (2).

Thalamotomy.—In 1947 Spiegel and his co-workers introduced a technique that they called *thalamotomy* (30). This operation involves not only a new operative technique but also an attack upon another part of the brain—the thalamus. A mechanical apparatus controls the insertion of a needle into the thalamus where a series of 5 to 7 small lesions are made by electrolysis or electrocoagulation in the dorsomedial nucleus. This procedure leaves the association fibers intact but destroys some of their connections in the thalamus. Preliminary reports on the results of this operation are favorable (29).

Cortical Undercutting.—A technique introduced in 1948 by Scoville is designated as *cortical undercutting* (28). This operation calls for making a line of cleavage at the junction of the grey and white matter in the prefrontal cortex, thus severing the underlying long association fibers. This procedure has the advantage of being done under direct vision, preserving more of the blood supply; and in addition Scoville claims it is an easier and faster operation than lobotomy. Preliminary results appear promising.

Venous Ligation.—Recently at Greystone Hospital in New Jersey a group of researchers have been studying the effects of stopping the blood supply to the forepart of the brain by tying the superior cerebral vein. Results of the procedure are not yet available.

AREA OF THE BRAIN ASSAULTED

Several areas or parts of the brain have been selected as sites for psychosurgical severances or ablations. In the lobotomies done by Moniz, and Freeman and Watts, the surgery involved the severance of fibers in both the upper and lower quadrants of the *pre-frontal lobes* (10). In 1945 Hofstatter and his associates restricted their surgery in lobotomies to the *orbital areas* or the lower quadrants of the frontal lobes. Their results were reported as moderately favorable (16). In 1948 Spiegel and his co-workers were the first to attack the *thalamus* (30). The first *unilateral temporal* lobotomy was done by Obrador in 1947, with unfavorable results (21). In 1947 Peyton performed the first *bilateral temporal* lobotomies, and in a series of 14 operations he considered 85% were successful (25). In 1948 Yahn made the first *parietal* lobotomy on a group of 22 patients, and found unfavorable results (33). In 1949 Torkildsen published an account of a *bilateral occipital* leucotomy. The operation did not remove distressing symptoms (31).

TYPES OF PATIENTS INVOLVED

Until recently most of the patients who have undergone psychosurgery were classified as chronically ill and hopeless psychotics. Most of them had previously undergone at least one type of shock treatment without benefit. The deteriorated state of many of the subjects is seen in the published reports, which described them merely as "back ward" patients. In the last few years, however, a few workers have begun to select patients for psychosurgery early during the course of illness providing other types of treatments have failed and the disabling symptoms continued to develop rapidly.

By far the greatest number of patients so far treated by psychosurgery have been drawn from the various psychotic groups. However, a survey of the different types of personality disorders that have been treated by this method reveals a considerable variety. Reports have been published of psychosurgical treatment of severe psychoneuroses, especially anxiety, depressive, and obsessive-compulsive states (10); hysteria (23); war neuroses (27); mentally deficient (3); psy-

chopathic personalities(23); melancholia (7); antisocial behavior in prisoners(18); sexual psychopaths(13); alcoholism(23); drug addicts(23); and delinquents(15). Mental patients with suicidal, homicidal, and destructive tendencies have been selected for psychosurgery, with the hope that they will become more manageable and less of a threat to their own life and the lives of others.

The ages of patients selected for psychosurgery range from children of 4 years to the very aged(32). Individuals of both sexes, married and single, from all levels of intelligence and from various socio-economic groups have been included. Some of the patients had been hospitalized for only short periods before psychosurgery, while at the other extreme some had been confined for more than 30 years.

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A CORRELATION OF LOBOTOMY RESULTS WITH BASIC REACTION TYPES

OLOF JOHNSON, M. A.,¹ AND RUTH EHRENBURG, M. D.²

Boston, Mass.

Since the first reports by Moniz in 1936 of the results of prefrontal lobotomy in mental illness, 2 basic criteria for favorable prognosis have been consistently stressed by investigators: emotional responsiveness and personality integration. Three recent large-scale studies of lobotomy results(1-3) have again emphasized the importance of these factors and have in addition indicated a significant correlation of postoperative changes with type of mental illness. These clinical summaries not only report a lower rate of recovery in schizophrenic patients as a group but give evidence of significant differences in outcome according to the type of emotional reaction. Thus Freeman and Watts rate 57% of their neurotic subjects as usefully occupied after operation in comparison with 49% of the involutional group and 31% of the schizophrenics. The Boston Psychopathic Hospital survey ranks the results of lobotomy in improving mental status according to diagnostic category: "One passes from the frankly psychoneurotic disturbances as giving the best results through the affective and schizophrenic disturbances, to the frankly schizophrenic illnesses which show the poorest results. In some respects each group is related to the one above and to the one below in symptomatology." The Connecticut Study reports differences in results between schizophrenic and nonschizophrenic patients and significant differences in recovery between the schizophrenic subgroups.

These 3 studies agree in the lower rate of recovery of schizophrenic patients after lobotomy and are in general accord in the differential effect of the operation on the special schizophrenic reaction types. The Connecticut Lobotomy Study and that of the Boston Psychopathic Hospital show the hebephrenic group as responding least favorably to the operation, and Freeman and

Watts(1) agree with this result in their clinical judgment, though their statistical breakdown shows "good" results for a slightly higher percentage of the hebephrenic group than for the catatonic or the paranoid. Freeman and Watts predict most favorable results among the schizophrenic group for the periodically disturbed catatonics, and the Boston Psychopathic Study also shows best recovery for catatonic patients, while the Connecticut Study finds the paranoid group to have responded somewhat better than the catatonic. The data of Rothschild and Kaye (4) are in agreement with the latter study.

Not only have these investigations agreed on the differing degree of recovery after lobotomy according to reaction type, but Freeman and Watts have noted a corresponding correlation between reaction type and speed of recovery. They state, "While some patients in the well-preserved obsessive-tension group, the anxiety neurosis group, and the involutional depression group, may recover in a few months and resume their former activities the patients suffering from prolonged depressions, very severe obsessive-compulsive reactions and schizophrenias, may require many months or even several years to attain the maximum of improvement."

The general agreement among the above-noted reports as to the results of prefrontal lobotomy strongly suggests that the degree and rate of relief afforded by this operation depends directly on the severity of the mental illnesses and that prognosis is much poorer for cases that have entered upon a course of chronic schizophrenic disintegration. The severity of a mental disturbance is indicated, presumably, by the type of reaction that most consistently expresses the emotionally maladjusted response, and thus represents the level at which conflict is being sustained within a process of personality regression. Accordingly it would seem most important in analyzing lobotomy results to

¹ Psychologist, Boston State Hospital.

² Senior Physician, Boston State Hospital.

make a careful clinical evaluation of the basic reaction type of the subjects, and to determine whether personality disintegration in the paranoid and schizophrenic reactions has progressed into a serious, chronic phase. Such an evaluation of type and degree of mental illness might be expected to demonstrate clear-cut and significant correlations between these variables and the degree and rate of clinical and social improvement after operation.

CLINICAL PROCEDURE

The authors have evaluated the clinical and social changes after lobotomy by the Lyster-Poppen technique in all 80 patients

The subjects are grouped under the headings of major neurotic and psychotic processes in what resembles a condensed form of a standard system of classification, thus providing a general continuum of degree of illness as shown in Table 1. In making these diagnoses all relevant clinical material has been re-evaluated without restriction to previous diagnoses found in records, and heavy reliance has been placed on the judgment of psychiatrists with intimate knowledge of the patients. Involutional reactions are eliminated in this simplified classification and such cases in this survey have been placed in the depressive group with such secondary processes as agitation and hypochondriasis

TABLE 1

DIAGNOSES

Basic psychotic process	No.	Age at onset	Length of illness	Age at operation
Group 1.				
Anxiety state with accompanying trends.....	2	31	10	41
Depression with accompanying trends.....	6	43	9	52
Paranoid condition.....	5	44	5	49
Schizophrenia with accompanying trends.....	9	26	7	33
Total (averages).....	22	35.1	7.6	42.7
Group 2.				
Paranoid schizophrenia.....	9	25	8	33
Catatonic schizophrenia.....	20	28	11	39
Chronic unclassified schizophrenia.....	12	26	13	38
Hebephrenic schizophrenia.....	8	21	7	28
Total (averages).....	49	25.7	10.2	35.9
Grand total (averages).....	71	28.6	9.4	38.0

who have received this treatment at the Boston State Hospital or have been institutionalized there before or after such surgery at the Boston Psychopathic Hospital during the period from 1944 to January 1, 1950. Using an expanded and revised form of the Malamud-Sands rating scale (5), as well as separate rating scales of degree of illness and level of social adjustment, we evaluated the preoperative status of the 73 subjects now living, on the basis of our personal knowledge, the judgment of psychiatrically trained personnel who had known the patients, and an analysis of case records. In similar fashion we have rated these patients in terms of their postoperative course of recovery and their condition as of October, 1, 1950, interviewing every patient for this purpose.

listed together as "accompanying trends." The presence of such secondary mechanisms implies conflict at different levels of development and integration and has led to the definition and use of a special category, "schizophrenia with accompanying trends," a group including those patients whose basic defense is a serious autistic withdrawal, but whose marked affective or obsessive components seem to have preserved their basic integration so that they have not regressed into a chronic condition of full schizophrenia characterized by emotional dulling, loss of contact, persistent hallucinations, widespread delusions, and intellectual disintegration. Accordingly we shall consider this group as a separate reaction type and include it with the types above it to form a total of 22 pa-

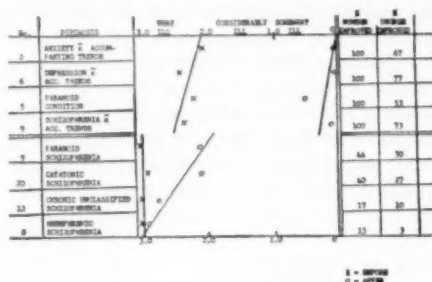
tients whom we consider though seriously ill to have retained their basic personality integration, in contrast to the 49 members of the "full schizophrenic" group, all of whom manifest most of the severe symptoms just listed. Our "special" group includes patients often diagnosed as dementia præcox, other types, but the present classification is not concerned with the mixed symptomatology but with their generally intact integration.

Our charts do not include data on 2 patients whose illnesses were directly due to gross organic pathology.

CLINICAL SUMMARY

The means for these groups show the expected onset of schizophrenic reactions in the twenties with the depressive and para-

highly with the level of integration at which conflict had been sustained before operation.



	BEFORE OP.	AFTER OP.	% IMPROV.
INTEGRATED PSYCHOTICS	2.2	0.4	70
FULL SCHIZOPHRENICS	3.0	2.3	17
TOTAL (67)	2.7	1.7	39

FIG. 1.—Change in basic psychotic process.

TABLE 2
SHIFT IN DEGREE OF ILLNESS

	Very ill	Considerably	Somewhat	Symptom-free	% improving
"Integrated" psychotics..... (Before) 27%	73%	..	..	..	100
(After) ..	..	18%	82%	..	..
"Full" schizophrenics..... (Before) 96%	4%	..	..	..	31
(After) 69%	4%	18%	8%	..	..
Total group..... (Before) 75%	25%	..	..	..	52
(After) 48%	3%	18%	31%	..	..

noid reactions most prominent in the fifth decade. It is significant that with the exception of the paranoid cases the groups have roughly a comparable length of illness of 7 to 13 years. In other words most of the patients of the "integrated" groups as well as the "full" schizophrenics have been so severely ill as to require long periods of hospitalization. The average length of illness for all patients before operation is 9.4 years, reflecting a conservative clinical policy of generally restricting the use of this radical operation to severe, chronic cases.

Fig. 1 demonstrates the shift in basic mental status brought about by lobotomy in the 71 cases under consideration, grouped according to basic disease process and scored on a 4-point rating scale according to degree of illness. It is apparent that regressive defenses do represent increasing degrees of illness and that degree of recovery correlates

The striking difference in results between the "integrated" groups and the "full" schizophrenics is presented in the table, which indicates that the former made over 4 times as great a gain in the reduction of psychopathology.

Table 2 illustrates the difference of degree in improvement in basic mental status shown by these 2 over-all groupings. Whereas 100% of the "integrated" psychotics improve markedly with 82% being free of symptoms, 69% of the "full" schizophrenics were considered to remain "very ill" and only 4 of 49 or 8% were relieved from their psychosis. In the total group 52% are significantly improved and 31% are free of symptoms. These results are within the range of those reported in similar surveys but somewhat lower than most, probably because of the severe illness of 75% of this group.

Fig. 2 shows the improvement in secondary processes of illness that accompanied the major ones, summarizing for this purpose only the most significant symptoms for each patient. These symptoms have been arranged in general order of severity from "anxiety" down to "untidiness" and since the categories of illness are in a general order of increasing severity we find, as we would expect, that our plot of secondary trends cor-

left shows the degree to which these associated symptoms have been relieved. It is to be noted that these figures do not represent the improvement in a given symptom for all 71 patients but merely for those in whom it was of outstanding clinical significance. The circled figures in the lower right-hand blocks indicate the 6 cases in which patients became worse after operation and shows also which symptoms were aggravated. Thus 4

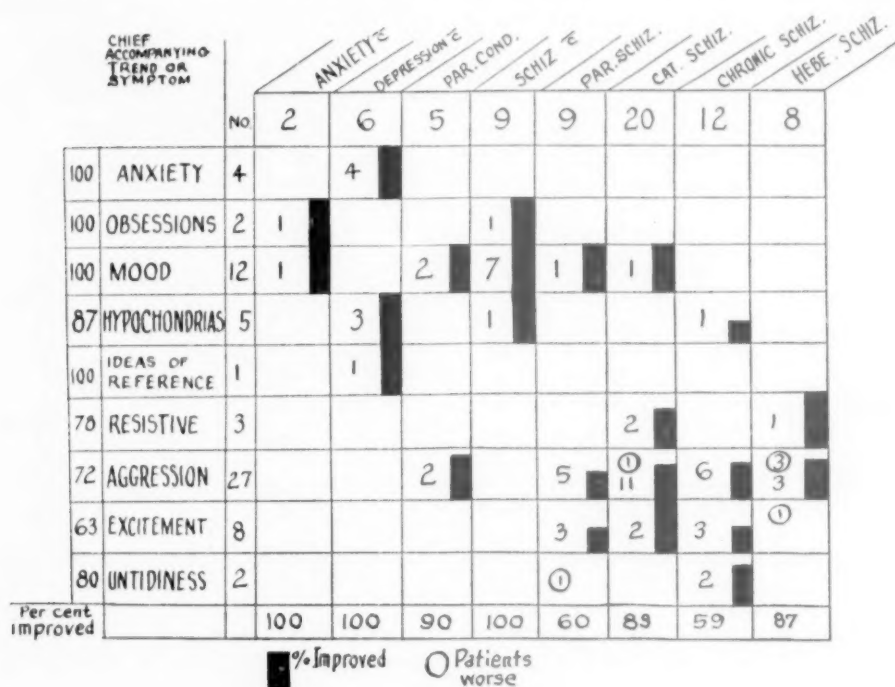


Fig. 2.—Change in accompanying trends and symptoms.

relates with the major processes to form a progression from the upper left-hand corner down to the lower right, since the more severe the personality disorder, the more primitive the type of associated symptoms. The solid bars in each column represent the degree that given symptoms have been reduced in each major form of illness and once again a progression is apparent from upper left to lower right, as indicating the decreasing success of lobotomy in eliminating completely the more serious symptoms in the chronic schizophrenic. The column of figures on the

of the 8 patients classed as hebephrenic schizophrenics have continued a disintegrative course, although operated on but a year after first admission to the hospital as an average.

These last 3 figures and tables show clearly that degree of improvement in mental status, both in basic illness and in chief accompanying trend, is closely related to the type of psychotic reaction, hence to the level at which conflict had been maintained and sustained before operation.

Similar correlations are revealed by a sur-

vey of change in social adjustment after lobotomy in the following figures, which also indicate the serious residuals that remain in these subjects after operation, despite marked decrease in the original psychopathology. Thus the apparent removal of a psychotic condition through lobotomy does not automatically restore a patient to his level of adjustment before illness, but his symptomatology seems relieved at the price of another form of personality inadequacy caused by the frontal lobe deficit. The degree and type of this personality change varies according to the individual's previous char-

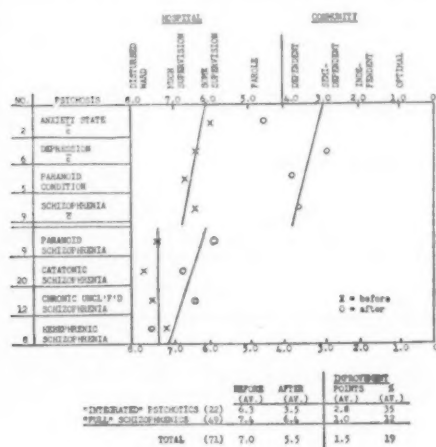


FIG. 3.—Change in social adjustment

acter and type and degree of his illness, but the failure of these patients to regain optimal social efficiency after operation must be regarded as due to a newly imposed organic deficit operating in conjunction with some degree of persisting personality abnormality.

Fig. 3 shows graphically the change in social adjustment following lobotomy as plotted on an 8-point scale, which ranges from placement on a disturbed ward to recovery to the optimal level of social effectiveness demonstrated in the past. Here again degree of social recovery correlates in high degree with reaction type, as representing the level at which the tension of conflict was tolerated before operation. Once again the "full" schizophrenic group changes relatively little after operation, improving on the aver-

age but one level in hospital placement, one third of the progress made by the better groups on the average. It is significant that even the better groups do not in general regain a position of personal independence and social effectiveness after operation, despite their improvement in psychotic and neurotic symptoms. It is this gap in achievement that reflects the serious personality deficit, a considerable but undetermined part of which must be attributed to surgically inflicted loss (6, 7).

Fig. 4 presents graphically further data correlating improvement in social adjustment with severity of illness as represented by the reaction types. It will be noted that although every patient in the "integrated" groups im-

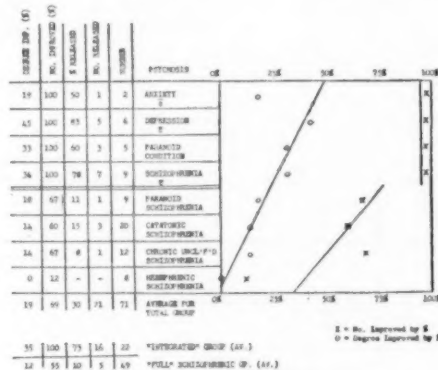


FIG. 4.—Change in social adjustment.

proved at least one level in adjustment, only 55% of the "full" schizophrenics were rated as having changed significantly. And although three-quarters of the better group have left the hospital, only 10% of the "full" schizophrenics have been discharged. This latter figure is among the lowest reported in surveys of lobotomy results in schizophrenics. It is undoubtedly due in some part to the extremely regressed condition of a large percentage of the patients included in this survey, but the further possibility remains that other surveys have included among their reported recoveries of schizophrenics such cases as we have here grouped under "schizophrenia with accompanying trends" and thus differentiated from patients suffering from a full schizophrenic regression. It is

apparent from this chart that 78% of the so-called "schizophrenics with trends" have left the hospital, so that the prognosis for improvement after lobotomy seems relatively good in cases of this group, but is markedly unfavorable in cases that have fully surren-

data just presented graphically, and again the disparity in therapeutic results between the two major groupings is apparent. The bottom block summarizes the total shift in adjustment in which 30% of all lobotomized patients are shown to have been discharged,

TABLE 3
SHIFT IN SOCIAL ADJUSTMENT

		Hospital		Community		Degree of improvement		
		Much supervision %	Mild supervision %	Dependent at home %	Independent below best %	Discharged %	Cons. imp'v. (hosp.) %	Slight imp'v. (hosp.) %
"Integrated" psychotics....	(Before)	46	54	..	..	..	..	..
	(After)	9	19	41	32	73	9	18
"Full" schizophrenics.....	(Before)	90	10	..	..	..	..	..
	(After)	59	31	8	2	10	14	31
Total group.....	(Before)	76	24	..	..	..	..	..
	(After)	44	26	20	10	30	13	27

RATE OF RECOVERY IN DISCHARGED PATIENTS

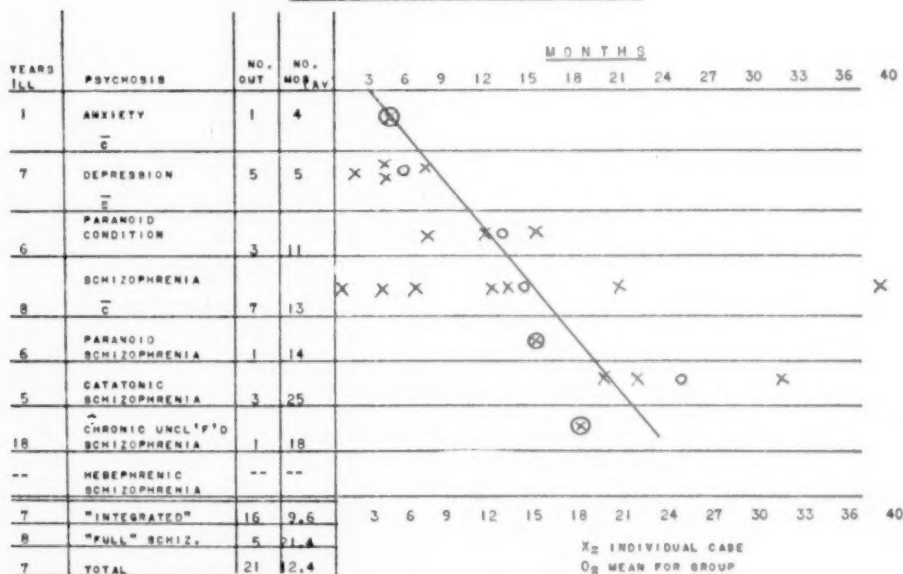


Fig. 5.—Rate of recovery in discharged patients (to Oct. 1, 1950).

dered to the schizophrenic psychosis. The circles in this graph represent the means of reaction type groups, indicating the amount of social recovery after lobotomy. The correlation is here seen to be great between level of illness and personal progress after operation.

Table 3 presents a tabular summary of the

13% more to have improved considerably within the hospital, and 27% to have made slight improvement.

If degree of recovery is so directly related to level of illness one might expect that rate of recovery from illness would be similarly correlated. Fig. 5 presents a plot of the number of months required for social

recovery to the point of readiness for discharge in the 21 cases of this type. It is evident that not only is the correlation extremely high for means of reaction type groups but the scatter within groups is quite compact. In the table at the left the recovery period for the "full" schizophrenics is shown to be more than double that of the average for the other types. This difference in speed of recovery is not a function of the length of illness as is shown in the column at the extreme left where the "integrated" group is seen to have been ill for 7 years as compared with 8 years for the other. Interestingly enough, the average length of illness for the schizophrenics "with trends" who

CONCLUSIONS

1. As suggested by previous lobotomy studies, the grouping of patients by basic reaction types of emotional disturbance, graded according to severity, reveals a consistent and marked correlation between level of illness and the degree and rate of clinical and social recovery. Though this correlation exists throughout the continuum of degree of illness, all types of disintegrated schizophrenics tend to respond to lobotomy in a generally limited degree and the groups of so-called "integrated" psychotics also tend toward a similar and more favorable reaction to the operation.

TABLE 4

STATUS OF MUCH IMPROVED PATIENTS AS OF MARCH 1, 1951

Psychosis	No.	Parole	Home	Level of social functions			
				(4) Completely dependent	(3) Some re- sponsibility	(2) Independ- ent below best	(1) Pre- psychotic level
Anxiety \bar{c}	2	..	2	1	..	1	.. ..
Depression \bar{c}	6	1	5	..	1	4	..
Paranoid condition.....	5	1	3	..	3	..	..
Schizophrenia \bar{c}	9	1	8	3	1	4	..
Paranoid schizophrenia.....	9	2	1	..	..	1	..
Catatonic schizophrenia.....	20	1	3	3	..	..	..
Chronic uncl'd schizophrenia....	12	..	1	..	1	..	..
Hebephrenic schizophrenia.....	8	..	..	..	..	..	..
Total	71	6	23	7	6	10	..
"Integrated"	22	3	18	4	5	9	0
"Full" schiz.....	49	3	5	3	1	1	0

were discharged is 8 years, so that they too must be considered a group of chronic psychotics.

Table 4 represents the level of social recovery of those patients who have left the hospital. The positive features of the foregoing statistics, which reported improvement in mental status and progress from the hospital, are here balanced by evidence that the progress of these patients in most cases has not been optimal. Not one such patient may be considered restored completely to his best previous level of social function; one-third lead completely dependent lives and another third require some economic support and supervision. And once again there is shown to be a marked correlation between present status and previous level of illness.

2. Similarly, the speed of recovery after lobotomy correlates in high degree with severity of illness. The time required for recovery to the point of readiness for discharge from the hospital is on the average more than double for the "full schizophrenics" than for the integrated psychotics. The speed of recovery is not a function of the length of illness before operation.

3. A careful differentiation of all patients into 2 general groupings of those maintaining a basic integration of the self and those suffering from widespread schizophrenic disorganization demonstrates marked differences in rate and degree of clinical and social recovery. Thus 82% of the former group are symptom-free and have been discharged from the hospital, but only 8% of the latter

were freed from psychosis and but 10% have been returned to the community.

4. Although less favorable results have been consistently reported by investigators for schizophrenic cases, the high recovery rate of 77% in a special classification of "schizophrenics with accompanying trends" suggests that the crucial factor in prognosis is not the presence of a schizophrenic process but whether this illness has progressed to a stage of chronic and general personality disorganization marked by the persisting features of emotional dulling, loss of contact with people, widespread delusions, hallucinations, and intellectual disintegration.

5. Of the total group of 71 lobotomized patients here considered, 30% recovered quite completely from their illness and have been returned to the community. Another 13% is considerably improved but still institutionalized and an additional 27% made a slight but significant gain in level of adjustment within the hospital. Nine percent are more ill after the operation than before. These results are comparable to those recorded elsewhere for similar groups of patients but toward the lower end of the range of gains.

6. Despite the degree of recovery reported above, with an understandable emphasis on the criterion of discharge from the hospital,

the postoperative progress of these patients toward personal independence and social effectiveness is limited, since two-thirds of those discharged are completely or partly dependent on others for economic support or supervision. Since the symptoms of previous illness have been generally removed in these cases, this impairment in personal efficiency seems due in considerable part to the frontal lobe deficit produced by lobotomy with the technique employed in our cases.

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TRANSORBITAL LOBOTOMY

THE PROBLEM OF THE THICK ORBITAL PLATE¹

WALTER FREEMAN, M.D., PH. D., WASHINGTON, D. C.

A number of different techniques are currently being employed in the performance of transorbital lobotomy. Fiamberti(1) has used principally the Moniz leucotome for cutting cores of white matter beneath the frontal cortex. Freeman(2) adapted the icepick for severing the thalamofrontal radiation after perforation of the orbital plate. Moore(3) designed a somewhat different instrument with a guiding arm to show where the point of the instrument was situated. Putnam(4) has used a curved instrument with a cutting edge, and also a trocar and cannula for injection of procaine base into the frontal white matter. The problem presented is that of interrupting the important pathways in the frontal lobe with the least damage to the cortex or to the blood vessels. The safety of transorbital lobotomy has been demonstrated by several series of cases(5, 6). Its effectiveness has been enhanced by the deep frontal cut(7), but a limiting factor in this deep frontal cut has been the thickness and toughness of the orbital plate in certain patients. The use of a curved instrument, that may be rotated so as to sever pathways beyond the reach of the straight instrument, may accomplish this, but the likelihood of laceration of vessels renders this method suspect until proven safe—and equally effective—in severing the thalamofrontal radiation.

Autopsy studies in 15 cases(8) have shown that a considerable movement of the instrument is necessary if the operator is to sever more than a minimum of fibers. Indeed, Walsh(9) was rather discouraged to find that the lesion in one of his cases was scarcely more than a stab-wound. On the other hand, too great movement of the instrument may sever arteries on the medial or lateral surface of the hemisphere and thus produce uncontrollable hemorrhage.

Another complication, encountered in 4 cases out of some 800, has been the breaking of the transorbital leucotome with a considerable fragment of the shaft remaining behind. In 2 cases, followed for more than 2 years, the 4 cm. length of point and shaft has caused no difficulties, but in the third case, where the deep frontal cut was forced beyond the capacity of the leucotome, the shaft broke at the 6 cm. mark with laceration of the eyeball, and later had to be removed by craniotomy (Figs. 1 and 2).

Bending of instruments is safer than breaking but does not accomplish the deep frontal cut, and therefore fails to relieve the patient. Sometimes the orbital plate is so tough that scarcely any movement is possible, and then the patient shows no change at all in his condition. If transorbital lobotomy is to be carried out in severe cases of chronic schizophrenia, it should be with complete severing of the thalamofrontal radiation. In 33 cases in which the primary operation failed to bring relief, reoperation with the deep frontal cut was effective in 20, ineffective in 12, and followed by fatal post-operative hemorrhage in 1. The value of the deep frontal cut is thus reasonably established, although it hardly needs to be emphasized that it by no means always succeeds in abolishing the mental disorder.

Since the deep frontal cut appears to be of such importance for the relief of mental symptoms and also of pain, means for safely severing the fibers closer to the base of the brain had to be found.

THE ORBITOCLAST

Our approach to this problem has been the application of an instrument much more sturdily constructed than the transorbital leucotome. The orbitoclast² is 23 cm. in

¹ From the Department of Neurology and Neurological Surgery, George Washington University.

² The orbitoclast, like the transorbital leucotome, is made by H. A. Ator, 5332 29th St., N.W., Washington 8, D. C.

length, divided into shaft 13 cm. and handle 10 cm. It is constructed from tool steel 8 mm. in diameter, with the shaft tapering to a rather blunt point. At the 5 cm. mark, which is the location of the maximum stress, the shaft is 5 mm. in diameter. The handle has a hole drilled through it 7 cm. from the top so that measurements may be made on the photograph, taken in profile, to reveal the approximate location of the point of the instrument. The strength of the instrument was tested by inserting the point through the keyhole of a door and lifting with a force of 25 kg. on the handle, without bending or breaking the instrument. The instrument, therefore, is sufficiently rugged for the job it is designed for; namely, fracturing the orbital plate without danger of bending or breaking the instrument.

The orbitoclast has been used now in 70 operations, with failure to produce a satisfactory deep frontal cut in only 2 instances. Usually it is employed only after it has been proved that the transorbital leucotome will not accomplish the deep frontal cut. However, when the transorbital leucotome has been tried without success on one side because of resistance on the part of the orbital plate and has been replaced by the orbitoclast, the second orbitoclast is employed from the beginning in the operation in the opposite side.

TECHNIQUE

The technique of transorbital lobotomy is well within the capacity of the neuro-psychiatrist. The operation is performed through a sterile field, the conjunctiva, that cannot be contaminated by the patient. No preoperative preparation beyond that required for shock therapy is necessary. Anesthesia is accomplished by 1 to 6 electroshocks given at 2-minute intervals. This type of "anesthesia" has multiple advantages. It is safe, easy, simple, even in the most resistive patient. It hastens the coagulation of the blood. It interrupts temporarily the ideational activity of the psychotic patient. The patient recovers consciousness rapidly and hence needs little postoperative supervision. In 2 recent papers, Moore and his colleagues (10, 11) have stressed the fact that "from 12 to 15 patients can be operated on by this method

in the time required for one patient by most of the operative techniques" Transorbital lobotomy can be carried out under pentothal or other general anesthesia, but postoperative shock therapy in these cases is often necessary to further the recovery. Local anesthesia has a place in patients who are poor risks.

When the patient is prepared, the nose and mouth are covered with a towel and the point of the transorbital leucotome is introduced beneath the upper eyelid, 3 cm. from the midline and well back in the vault of the orbit. This means that the eyeball is rather firmly pressed upon. The shaft of the instrument is aimed parallel with the bony ridge of the nose, and the handle is struck sharply with a hammer in order to drive the point through the orbital plate. When the 5 cm. mark is opposite the upper eyelid, the handle of the instrument is drawn far laterally, then returned to an angle of 30° with the parasagittal plane and driven to the 7 cm. mark. Allowing 2 cm. for the orbital tissues, the point is now 5 cm. within the white matter of the frontal lobe. In order to sever the upper portions of the thalamofrontal radiation, the handle is displaced first toward the nose about 20°-30°, and then laterally by the same amount, always maintaining the shaft of the instrument in frontal plane corresponding to the bridge of the nose. Then follows the deep frontal cut.

The deep frontal cut is an oblique incision that severs the fibers of the thalamofrontal radiation as they bend around the anterior horn of the ventricle. A straight sagittal incision will miss them, and in addition will endanger arteries overlying the frontal operculum and insula. On the other hand, it is possible by too great deviation laterally of the handle of the instrument to sever arteries on the medial surface of the hemisphere. In case of doubt, the instrument can be oriented by returning it to the parasagittal plane and again taking proper bearings. In making the deep frontal cut, the handle of the instrument is maintained in the plane 30° from parasagittal, and elevated against the resistance of the orbital plate. If the orbital plate fails to yield to a force well below the breaking point of the instrument, the operator

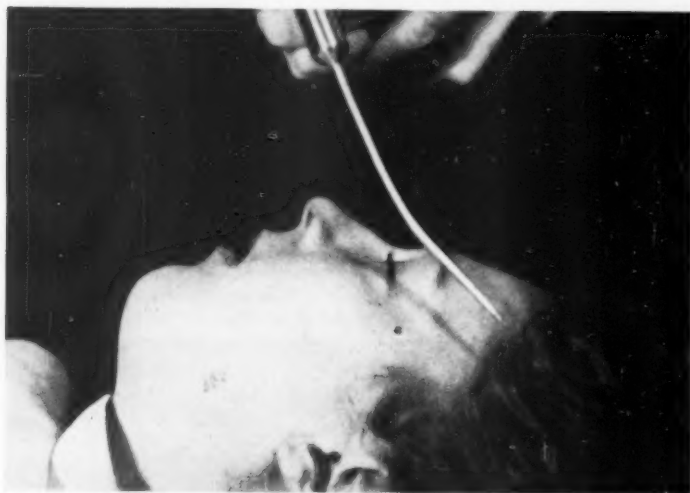


FIG. 1.—Case 398. At the first transorbital lobotomy the shaft of the instrument bent with no change in patient's behavior.

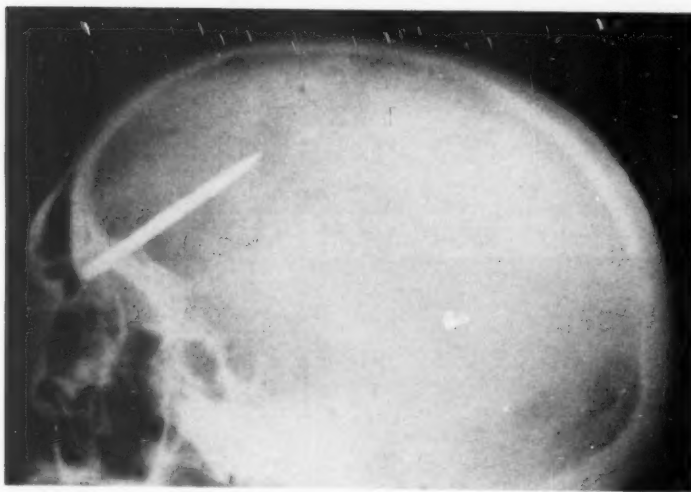


FIG. 2.—Case 398. At the second transorbital lobotomy the shaft of the instrument broke at the 6 cm. mark with laceration of the eyeball. The fragment was later removed by craniotomy. The patient's mental condition was unimproved.



FIG. 3.—Case 490. Orbitoclast in primary position parallel with the bony ridge of the nose.



FIG. 4.—Case 490. Orbitoclast in elevated position making deep frontal cut.



FIG. 5.—Case 490. Superimposed roentgenograms illustrating the range of movement of the orbitoclast within the frontal lobe.

should withdraw it and substitute the orbitoclast. The point of entrance is usually easily found, and the instrument can be driven to the desired depth and angle without difficulty.

The orbital plate that necessitates the use of the orbitoclast is thick and tough; therefore, considerable force is usually required to fracture it. Since so much depends upon a satisfactory performance of the deep frontal cut in such cases, every effort should be made to accomplish it by means of maximum leverage. The instrument is designed to withstand a pull of 25 kg. and, with counter-pressure on the patient's chin, there is often a sharp snapping or crunching sound that occurs when the orbital plate gives way. This can be dismaying to the operator unless he has become familiar with it by previous work on the cadaver.

For purposes of orientation and recording of the deep frontal cut, the handle of the instrument is moved to the parasagittal plane again and a photograph is taken in profile. The small hole in the handle of the instrument is 7 cm. from the top, and on the photograph the position of the tip of the instrument may easily be traced.

COMPLICATIONS

When the orbitoclast is withdrawn it is sometimes followed by a gush of blood often mixed with ventricular fluid. In most instances this is unimportant and soon ceases. Seepage of bloody liquid may persist for a few hours. Swelling and discoloration of the eyelids is a bit more prevalent than after the use of the leucotome alone, probably due to the greater diameter of the perforation between the intracranial cavity and the orbital tissues. There have been no deaths following the use of this instrument. One patient developed cerebrospinal rhinorrhea more than 2 weeks after operation at the end of a plane trip. Meningitis developed following the use of nose drops, but no organisms were cultured, the fever dropped to normal in 2 days, and the fistula closed at that time. There have been no convulsive episodes during the year that this instrument has been in use. No damage to the eyes beyond subconjunctival hemorrhage has been noted.

It is not advisable to employ the orbito-

clast when the orbital plate is thin, because of the possibility of extensive fracture. This has 2 deterrents. In the first place, fragments of orbital plate may be driven into the brain; secondly, a large opening may prevent the development of a satisfactory fulcrum for guiding the movements of the instrument within the brain. While it might seem to add some risk of infection to withdraw the leucotome and introduce the orbitoclast, this is on a theoretical level, and the risk can be minimized by the use of additional injections of penicillin to the single dose routinely used as prophylactic.

The range of movement of the orbitoclast is revealed in Figs. 3, and 4 and Fig. 5 shows the roentgenograms superimposed.

Thirty-six of the first 50 patients requiring use of the orbitoclast were women, the youngest a girl of 13. All the patients were white, the 7 Negroes in the whole series (735) of transorbital lobotomy cases having orbital plates thin enough to permit adequate movement of the transorbital leucotome. The preponderance of tough orbital plates in young white women was unexpected. Both the patients who withstood maximal force were young white women and both failed to respond to operation. Twenty of the 50 operations with the orbitoclast were secondary operations; that is, carried out after failure of the original transorbital lobotomy. Half of these patients were benefited. In the 30 operations done originally with the orbitoclast, the proportion of success to failure was the same. It is therefore concluded that the use of the orbitoclast in appropriate cases adds materially to the expectation of success.

SUMMARY

A method for overcoming the resistance presented by a thick and tough orbital plate in the performance of transorbital lobotomy is described. Its use in 70 cases has demonstrated its value.

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THE ORIGINAL CASE MATERIAL OF PSYCHOANALYSIS

CHARLES E. GOSHEN, M.D.,¹ HEMPSTEAD, N. Y.

The field of psychoanalysis has attracted to its folds some of the most brilliant thinkers of our generation, yet in spite of this brilliance we can see one schism after another develop in our theoretical formulations. Perhaps in no other field except religion has there been so much disagreement among such competent thinkers. From our mid-century vantage point today, we should be able to make an accurate assessment of all the claims and counterclaims of the past 50 years in order to make sense out of them. In my own practice, I have operated within the so-called "cultural" framework, and have been, therefore, inclined to be critical of the Freudian orientation. The tendency of the culturalist would be to conclude that Freud arrived at his theoretical formulations on the basis either of lack of clinical intelligence or of dishonesty. However, the more one studies Freud himself, the more one is impressed by both his genius and his honesty. These conclusions still fail to render his theories palatable, and Freud himself seemed quite displeased with them toward the end of his career. The articles he wrote in his later life indicate that he experienced considerable discontent with the very theories he himself invented. When we discover a paradox of this order, we can often gain insight into the dilemma by re-examining the original observations, so it occurred to me to re-examine the clinical material on which Freud based his theories. Following is a list of character sketches of all the cases Freud reported, from which he formulated his theories, presented in his and Breuer's own words.

Anna O.: Illness began at age 21. There were several cases of psychosis in her family and both parents were "nervous." She had a keen, intuitive intellect, a craving for psychic fodder and was endowed with a sensitivity for poetry and phantasy, but was controlled by a very strong and critical mind.

She was completely unsuggestible. Her will was energetic, unpenetrable, and persevering, sometimes mounting to selfishness. She showed a sort of sympathetic kindness manifested by her tendency to look for poor or sick people to take care of. Her moods showed a tendency to excess of merriment and sadness. Sexually she was astonishingly undeveloped. She had never experienced any love and, in the whole mass of hallucinations that characterized her illness, love played no part.

She led a monotonous existence with her puritanical family, spending most of her time daydreaming. Although she seemed to be in touch with people in her environment, she really lived in fairyland.

Her symptoms were paraphrasia, convergent strabismus, disturbances of hearing, paralysis and contractions. These improved until the death of her father led to a period of continuous somnambulism for several months. She became weak, anemic, evidenced a disgust for food, and developed a persistent "nervous" cough, with marked paralysis, contractures, and anesthesia. She demonstrated, then, 2 separate states of consciousness; in one she knew her environment to be sad and anxious but otherwise normal and in the other she hallucinated, was "naughty," threw things at people, tore off buttons, and felt she was going "crazy."

At the peak of her illness she had only brief periods of clear consciousness, and showed extreme fluctuations in mood with anxious hallucinations of snakes. She exhorted herself not to be stupid, complained of the "deep darkness" of her head, could not think, and complained she was going blind and deaf. She was thoroughly confused in the use of language, tried using words from several different languages, and often spoke jargon. She seemed oblivious of anybody who might visit her, especially strangers.

As she improved, she revealed more about the content of her hallucinations, but developed every point in the form of phantastic

¹ In the preparation of this paper Dr. Bernard S. Robbins collaborated with me but the wording is mine.

formulas. She terminated treatment, "but it took some considerable time before her psychic equilibrium was restored. She has since then enjoyed perfect health."

Mrs. Emmy von H.: A woman of 40 who was "hysterical" and easily hypnotized. She was found on the first examination to be youthful looking, but her face betrayed a tense, painful expression, her eyes deep-set, her look downcast, her forehead deeply wrinkled. She spoke in a low voice interrupted at times by a spastic impediment. Her fingers showed an incessant athetoid fidgetiness, her face showed a tic, and her neck muscles on the right stood out prominently. She frequently interrupted herself to produce a peculiar smacking noise.

She spoke in a coherent, intelligent way yet would suddenly stop and contort her face with fear and disgust, point with her finger and call out, anxiously, "Keep quiet—don't speak—don't touch me." She was probably under the impression of a stereotyped, terrifying hallucination and warded off the interference of the stranger with this formula.

She came from a wealthy family in which she was the thirteenth of 14 children. She was compulsively brought up by an overstrict mother. At 23 she married a man much older than she. He died soon afterwards, leaving her with 2 daughters. Her illness dated from the time of her husband's death 14 years before. She complained during that time of feeling depressed, sleeplessness, and pain.

Freud was struck by the fact that she was startled and severely frightened by his visits, making grimaces and trembling. She complained chiefly to him of cold sensations and pains in her right leg. When hypnotized, she sank down with an expression of stupefaction and confusion. Once she entertained Freud by reading him harrowing animal stories. She reacted to this with horror, and revealed the content of her hallucinations, which had to do with rats being in bed with her. This led to her recalling that she had had fainting attacks with convulsions as a child when confronted with dead animals. Freud described these images as "hysterical delirium."

Miss Lucie R.: A young English gover-

ness referred for treatment for a chronic purulent rhinitis. She had lost all perception of smell, was depressed in spirits, weak, and complained of unpleasant odors, "heavy head," loss of appetite, and incapacity for work. She showed a general analgesia. The subjective sensations of smell were interpreted to be recurrent olfactory hallucinations. She could not be hypnotized. During the treatment period of 9 weeks she revealed that she felt she was a victim of intrigue on the part of the members of the household in which she worked. This suspicion arose in relation to her feeling rejected by the master of the house after she had built up a phantasy that he was romantically interested in her. Both the romantic interest and the rejection were her distortions. The olfactory hallucination reminded her of the odor of burned pastry; it originated at a time when she received a letter from her mother. At the same time she was cooking pastry with the children she was taking care of. The incident revolved around the children showing her affection at a time when she had given her employer her resignation from the job. All of this became phantastically elaborated into the unpleasant hallucination that seemed to serve the purpose of warding off her feelings toward her employer.

Miss Elizabeth v. R.: A 24-year-old lady suffering from pains in her legs for 2 years. The patient had previously taken an active part in many misfortunes that had befallen her family. She seemed intelligent and psychically normal, bearing her affliction with a cheerful mien. Although the pain was severely intense and disabling, the patient could give no clear description of its quality or location, and when the painful area was touched she showed an expression more like pleasure than pain. She had suffered a disappointment in love because of the responsibilities she had assumed in taking care of her father during his terminal illness. The pain in her legs was found to be related in a phantastic way to her father's death, the apparent rejection by her boy-friend, and the fear of "standing alone" in life. Discussions about those historical events intensified her symptoms. Her symptoms had previously been used as a device to maintain an almost

complete isolation from other people for 1½ years.

Katrina: An 18-year-old girl who complained of nervousness, was morose, sulky, and had difficulty in breathing with constant feeling of choking. She was in perpetual fear of dying and believed there was always someone behind her ready to grab her. She had anxiety attacks in which she saw a man's face, which Freud found to represent her uncle, but she had not been able to recognize it.

Dora: An 18-year-old girl who had taken care of her sick father. Her mother presented the picture of a "housewife psychosis." The patient complained of chronic dyspnea with migraine, nervous coughing, and loss of speech. She was low in spirits and demonstrated a great resentment toward her mother and father. She threatened suicide, was unsociable, and had phantasied a seduction by a friend of the family whom she previously worshipped and now intensely hated. This experience in phantasy had left her with a "sensory hallucination" manifested by a feeling of pressure of this man's body against her, which was revolting to her.

"A case of obsessional neurosis": A young man of university education suffering from obsessions since childhood. He had a fear something would happen to his father and his girl-friend, and had compulsive impulses to cut his throat with a razor. First gave the impression of being clear-headed and shrewd. Stressed his sexual problems, and had come to Freud because he had heard of Freud's sexual theories. When tormented by his impulses he would go to a friend to get reassurance that he was not looked upon as a criminal. History of sexual preoccupation since age 6. Had phantasies of rats eating his girl-friend's buttocks. This both pleased and horrified him. He had "senseless and unintelligible" ideas that his obsessions could be rectified by paying a sum of money to a certain army officer. Tremendous disproportion between affect and ideational content.

"From the history of an infantile neurosis": Young man who had an "anxiety hysteria" with animal phobias from age 4 to 10, previously diagnosed as "manic-depressive"—no change during first years of treat-

ment—presented himself as unassailably entrenched behind an attitude of obliging apathy. When he finally began to make an effort to do his share of the work in treatment he stopped in order to forestall any change.

Environment as a child was marked by parents, who married young, supposedly leading a "happy married life." The mother suffered from abdominal disorders, and the father suffered from attacks of depression. Because of mother's poor health she had relatively little to do with the children; there was a sister 2 years older. They were taken care of by a nurse. As a child he was said to be good-natured, tractable, and quiet; relatives saw him as more of a girl than his sister was. When he was about 5, parents returned from a vacation to find him discontented, irritable, violent. He took offense at every occasion and flew into rages. At the time he had an English governess who was eccentric, quarrelsome, and alcoholic. Later on said he developed a phobia of a wolf and at this time had a fear and loathing of beetles and caterpillars yet would torment them and cut them up in pieces, would scream if he saw a horse beaten yet would beat horses himself, became very pious in his childhood, carried out many religious ceremonials of his own invention.

After years of treatment patient improved somewhat and later broke down into a paranoid state.

Summary of Case Material: All these cases were diagnosed by Freud as cases of hysteria and obsessive-compulsive neurosis. Nowadays, when we see a classical conversion hysteria or obsessive-compulsive neurosis, we almost immediately suspect schizophrenia. Could it have been that these original cases of Freud's were schizophrenics too? I believe there is a great deal of evidence to support such a supposition, if we view these cases in the light of greater knowledge of schizophrenia that we have today.

These 8 cases showed the following evidences for such a diagnosis:

(1) *Anna O.:* "A sensitiveness for poetry and phantasy," "a tendency to show excesses of merriment and sadness," "never experienced any love," "spent most of her time daydreaming, really living in fairyland," his-

tory of long periods of somnambulism, 2 states of consciousness, hallucinations of snakes, extremely impulsive destructiveness, "complained of the deep darkness in her head," "often spoke jargon," "seemed oblivious to visitors."

(2) *Mrs. Emmy von N.*: "A tense painful expression with downcast look," produced "peculiar smacking noises with her lips," "speech was interrupted by expressions of fear and disgust and the exclamation: 'Keep quiet—don't speak, don't touch me,'" "she seemed to be under the impression of a stereotyped terrifying hallucination," made grimaces and appeared terrified by Freud's visits, hallucinated rats being in bed with her.

(3) *Miss Lucie R.*: Olfactory hallucinations, believed she was the victim of intrigue, phantastic development of a conflict over other people's regard for her into the symptom of unpleasant odors.

(4) *Miss Elizabeth v. R.*: Inability to describe or localize her pains, evidenced pleasure when the painful area pinched, phantastic elaboration of her reaction to father's death and rejection by her boy-friend into the somatic symptom, use of the symptom to isolate herself from people for 1½ years.

(5) *Katrina*: "Perpetual fear of dying with constant feeling there was someone behind ready to grab her," hallucinations of a frightening man's face.

(6) *Dora*: Psychotic mother, phantasied a seduction by a friend of the family, unreasonable hate toward this man, "hallucination of a man's body being pressed against hers."

(7) "*A case of obsessional neurosis*": "Obsessions since childhood," phantasies of rats eating a girl's buttocks, "tremendous disproportion between affect and ideational content," completely irrational idea that paying someone some money would solve his problem.

(8) "*The Wolfman*": "Previously diagnosed as manic-depressive," phobia of a wolf as a child, bizarre behavior toward animals, violently objecting to other's mistreating them while torturing them himself, later in life broke down into a frankly paranoid state.

DISCUSSION

If Freud established his theories on the basis of an original mistake, what, then, can

be deduced from the theories? I believe the theories do develop logically, but that they add up to a conclusion quite different from the one Freud intended.

This unique situation is reminiscent of similar mistakes in other branches of medicine that led to the development of erroneous theories. The Japanese bacteriologist Naguchi isolated a leptospiral organism from a patient he thought had yellow fever, and on the basis of shrewd and honest scientific research built up a theory of the etiology of yellow fever. Sometime later, it was discovered that his original cases did not have yellow fever, but had Weil's disease. In the last century the English physician Hunter scientifically established the epidemiology of syphilis by infecting himself. However, a great deal of confusion later arose over the clinical picture of syphilis because he had also, unknowingly, contracted gonorrhea at the same time and described the 2 diseases as one. In another instance, we have recently seen a great deal of publicity over Sister Kenny's new treatment for polio, the claims for which no one else has been able to substantiate. Now we know that the original cases she treated were not really cases of polio.

In the light of this new viewpoint about Freud's sources of clinical observation, the entire Freudian theorizing becomes quite clear. Let us take up, step by step, the development of his theories as he himself portrayed them. Originally, he felt that therapeutic success could be achieved by abreaction under hypnosis. This did not represent anything new, for it was simply an observation of the age-old adage that "confession is good for the soul." During the middle 1890's he spoke of the so-called hysteric, treating this difficulty as if it were a "foreign body." Isn't this strangely parallel to Laetitia Bender's "incorporated foreign body" of the childhood schizophrenic? It is specifically in the schizophrenic that we see the patient splitting his emotional life off from reality as if his emotions were extraneous to himself. This we don't see in the patient we today consider as neurotic. Later, Freud began to claim that in all his patients he found evidence of a sexual seduction in childhood, but after the turn of the century he modified this when he discovered that these reports were

phantasies rather than realities. Here again is a phenomenon we find almost exclusively in the schizophrenic—the difficulty in distinguishing between phantasy and reality. By 1910 Freud had established his libido theory, which came to be characterized primarily by the importance of the oedipal conflict and castration fear. Here again, our present-day experience with schizophrenics shows us that these are the patients in whom we see actual incestuous wishes, death wishes toward parents, and the terrifying fear of mutilation. At this point Freud concluded that the motivating factor in emotional disorders was the instinctual endowment in the sexual area with which the individual faces life. During this period of his investigations he was faced with the alternative possibility of ascribing the “neurotic’s” difficulties to interaction between himself and his environment during childhood. In the light of what we know today about the schizophrenic this choice, a mistaken one from the cultural point of view, seems more understandable, though still erroneous. The schizophrenic, above all, is least touched by his cultural environment, and the inception of his difficulties begins at a much earlier age than in the case of the real neurotic. To that extent then, it was appropriate that Freud concluded that his patients brought with them to their “oedipal period” a framework on which “neurosis” easily fitted. Of course he felt this implied that the source of trouble came from their instincts, which seemed to him the logical conclusion.

In the light of our present-day knowledge of the schizophrenic, where do we see their greatest difficulties arising? It is certainly in their inability to establish cooperative relationships with others. Within those relationships what is the greatest threat to the schizophrenic? It is certainly the threat of getting close to people, and of course, mature sexual relationships demand the greatest degree of closeness. Freud’s early belief that his patients’ libidos were their primary source of anxiety has considerable validity when we translate this theory into the language of the schizophrenic, that is: the latter’s difficulties have a lot to do with his desperate need to reach out to people, but his efforts in that

direction are sabotaged by his desperate fear of making relationships in which he has any responsibility.

The phenomenon of “transference” was described by Freud in such a way as to indicate his belief that the patient sees the analyst as a parent. If this actually happens, it is a delusion and therefore can be expected in a schizophrenic.

What I actually see in my patients is that, when the patient is so confused about my identity, that patient is inevitably, for this and many other reasons, schizophrenic. Likewise, when we see the analyst visualizing himself as the patient’s father, similar deductions may be made about him, too.

After World War I Freud developed his death instinct theory and his metapsychology. In this he portrays the life of the “neurotic” as a self-destructive one, which is eminently characteristic of the schizophrenic, though not necessarily of instinctual origin. The topography of the psyche as described by Freud and widely elaborated upon by Abraham and Alexander, in which the ego, super-ego, and id are painted as if they were 3 separate characters in a play, is again a phenomenon we see in the schizophrenic’s way of thinking. This is really another way of describing the schizophrenic’s maneuver of “splitting” his personality into isolated compartments.

Throughout Freud’s psychiatric lifetime he stoutly maintained that schizophrenia was not treatable with psychoanalytic techniques. If his theories, without his knowing it, were based on observations of schizophrenics, it was consistent that he decided in the 1930’s (“Analysis Terminable and Interminable”) that the future of analytic treatment looked very black.

As we look back upon this remarkable sequence of events in the history of psychoanalysis, we wonder why it happened that Freud used schizophrenics on whom to base his observations. In this connection it is enlightening to recall that Bleuler remarked with great surprise that Freud’s theories were most clearly exemplified in the schizophrenic. We know today, when any new panacea for human happiness is presented to the public in a startling way and with the

disapproval of the more conservative elements in society, that it is the schizophrenics who are most likely to flock to the new fold. This was observable in the appearance of Christian Science and Dianetics. Freud, himself, mentioned that the "Wolfman" came to him because of the peculiar kind of appeal Freud's theories had. During the 1920's and 30's there was a rather widespread movement on foot among the intellectuals of the day who were revolting against old traditions to make Freud a spearhead for their ambitions. Freud was aware of this and consistently avoided being a party to it, although his precedent had led the way toward such a revolt.

We can now reasonably conjecture why Freud did not happen to make his original observations on neurotics rather than on schizophrenics. I believe it was largely due to his diagnostic nomenclature. The cases we would today call neurotic, he called the "actual neurosis," which he considered organically determined. The diagnostic categories were on a symptomatological basis, which is no longer considered valid. When we examine what Freud reported of the

character structure of these patients, we find them to have been schizophrenics.

In spite of this original error, however, there was still plenty of room for making subsequent observations on true cases of neurosis that might have given Freud a broader perspective. The fact that he did not employ later observations to change the basic concepts of his theories is probably attributable to his own personality structure.

To what use can we put Freud's theories, even though they were founded on an original error? I believe that in the light of what we can now see of their development we can conclude that the *Freudian theories represent an accurate appraisal of the way in which the schizophrenic views his life*. In other words, the use to which we can put the Freudian theories is this: they help us learn the schizophrenic's "modus operandi" or his own theory of his life, but our own theory of his life must necessarily be different. To put it another way, the Freudian theories teach us the "schizophrenic's language," which we must know to understand him, but to help him we must go one step further and teach him a rational language.

AN EVALUATION OF POSTELECTROSHOCK CONFUSION WITH THE REITER APPARATUS¹

JOHN SUMMERSKILL, B. A.,² WILLIAM SEEMAN, Ph. D.,³

AND

DONALD W. MEALS, M. A.

Philadelphia, Pa.

The experimental findings reported in this paper concern immediate confusional effects from a single electroconvulsive treatment with a specific apparatus, the Reiter Electrostimulator (Model CW46J). Since the first demonstration of electroconvulsive therapy by Cerletti and Bini in 1938, there have appeared a great many variations on Bini's original apparatus design. The Reiter apparatus represents a rather basic variation since unidirectional wave forms are substituted for the alternating current of the classical ECT machines. This direct-current technique was first reported in 1942 by Friedman and Wilcox(1), who worked with the apparatus constructed by Reiter. In recent years the Reiter Electrostimulator has been increasingly used in the treatment of mental patients.

There is little critical evidence on the comparative therapeutic merits of the various ECT techniques, but there has been considerable clinical opinion that the apparatus used in this research appreciably reduces immediate undesirable psychological effects from electrically stimulated convulsion. Kalinowsky and Hoch (2) are of the opinion that research on these effects is "of the greatest practical importance" since the possibility has been raised "that some of the unpleasant side-effects of convulsive therapy are not caused by the convulsion as such but by the type of stimulus applied, and that they can be overcome by modifying the stimulus."

¹ The authors wish to express their appreciation for the cooperation of the staff of the Philadelphia General Hospital where this study was undertaken as a project of the University of Pennsylvania Internship Program in Clinical Psychology. This paper was read at the 59th annual meeting of the American Psychological Association, Chicago, Ill., Aug. 31-Sept. 5, 1951.

² Now Clinical Psychologist, Student Medical Clinic, Cornell University.

³ Now at University of Minnesota.

Accordingly, the present research was undertaken to investigate the extent of confusion as a "side-effect" of electrical stimulation by the Reiter apparatus. This objective should not be construed as an attempt to evaluate the therapeutic efficacy of the Reiter apparatus or ECT in general. The specific hypothesis of the research is that the degree of confusion displayed by patients immediately following an initial treatment with the Reiter Electrostimulator does not differ significantly from the pretreatment degree of confusion, as measured under the conditions described below.

SUBJECTS

The subjects for the experiment were 22 patients at the Philadelphia General Hospital. A course of ECT had been prescribed for these patients by attending psychiatrists but none had received convulsive therapy of any kind during the 6 months prior to the experiment, according to available information. The subject group contained 11 men and 11 women whose ages ranged from 19 to 68 years with a median age of 30.5 years. The Wechsler-Bellevue IQ range for these patients, as measured before ECT, was 45 to 116.

Fourteen of the 22 subjects were outpatients at the hospital. Many of these were as seriously ill as the inpatients of the experimental group and would be hospitalized as beds became available. The subject group was heterogeneous with regard to diagnosis, with a preponderance of cases diagnosed as various forms of schizophrenia. There were, in addition, 3 cases with a diagnosis of involutional melancholia, a single case of manic-depressive (depressed) psychosis, and four cases in which the diagnosis was not clearly established.

PROCEDURE

Each of these subjects was given a series of psychological tests during the week prior to the initial administration of ECT. These tests were repeated following this first treatment, as soon as the patients were ambulatory, that is, within 30 minutes of the time of application of current.⁴ The pre- and post-treatment scores were then compared to discover the effects of this treatment on test performance.

All tests were administered by the 3 experimenters, testing in turn as subjects became available. Pre- and postshock testing of a given patient was carried out by the same experimenter.

The psychological instruments used were the following three:

(1) Orientation questionnaire: Two series of orientation questions were asked each subject before and after the convulsive treatment. One series, Form S, remained identical in pre- and posttesting and contained 8 questions frequently asked to establish extent of orientation in mental patients. The questions included: "What is your name?" "What is the date today?" "What is the name of the place where you now are?" etc.

The second orientation series was constructed in alternate Forms A and B to check on the possibility that orientation responses could be learned between pre- and posttesting, an effect that could contaminate results ascribed to the convulsion. Forms A and B each contained 10 alternate questions such as: "What color is your hair?" or "What color are your eyes?" etc. In 11 of the 22 cases Form A was administered before treatment with Form B following treatment; the order of Forms A and B was reversed in the other 11 cases.

(2) The Whipple-Healy Tapping Test was also administered before and after treatment. The instructions for this motor performance test are to tap once in $\frac{1}{2}$ inch squares as rapidly and accurately as possible. The performance is scored by determining how many pencil marks are correctly placed in a pattern of 180 squares in a 30-second trial.

⁴ A current of 5 to 25 milliamperes was delivered for 45 seconds. Placement of electrodes was bitemporal.

(3) The Wechsler-Bellevue Intelligence Test was the final test. The complete scale, with vocabulary subtest, was employed before and after shock. Form I of the Wechsler preceded shock in 11 cases and Form II followed, while the order of Forms I and II was reversed in the other 11 cases.

These tests were always administered in the above order, that is, orientation questionnaires, tapping test, Wechsler-Bellevue. The first 2 of these can be completed within 5 to 10 minutes and the Wechsler testing followed immediately.

RESULTS

The mean score of the experimental group was obtained for each of the tests employed. Mean pre- and posttreatment scores were then compared and evaluated for reliability of differences by use of the *t* test. (The product-moment correlation between paired observations was taken into account in determination of the standard error of differences.)

Pre- and posttreatment Wechsler scores did not differ significantly. The mean full scale IQ was 80.50 before ECT and 80.81 following ECT. This mean difference of .31 IQ points does not approach significance and is well within the discrepancy to be expected in using alternate forms of the Wechsler scale.

The posttreatment Wechsler verbal and performance IQ's differed from pretreatment scores by .28 and 1.0 IQ points respectively. Neither of these differences approaches significance.

Comparisons are not possible between subtest scores because the 2 forms of the Wechsler have not been equated for scoring at the subtest level.

The convulsive treatment was found to affect significantly both orientation and tapping scores. On Form S of the orientation questionnaire (this form was identical before and after treatment) treatment produced a drop of approximately 1 score point from a mean pretreatment score of 7.0 out of a possible 8—a difference that is significant at the 3% level of confidence. With alternate Forms A and B posttreatment scores were also lower, this difference of .55 score points

being not quite significant at the 5% level of confidence. When Forms S and A or B are combined the mean score decrease from 15.2 to 13.7 is significant at the 2% level.

However, the decrement in orientation scores was found to be almost entirely a function of increased posttreatment error in a certain subgroup of items—those items relating to orientation with respect to "time." Thus, a pre- and posttreatment item analysis of the 8-item Form S revealed that 80% of the errors that can be attributed to treatment occurred on the 3 items that tapped temporal orientation.

The average motor tapping performance of the group was also found to be significantly affected by the ECT. The mean pre-treatment score of 68 dropped to 57, representing a difference that is significant at the 2% level of confidence.

DISCUSSION

The authors believe that these results neither refute nor confirm the hypothesis of the experiment unequivocally although the weight of evidence appears in the direction of confirmation.

The Wechsler results are taken to have major significance. This test was designed by Wechsler to measure the "global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment" (8)—behavior that would appear to be highly sensitive to change in the confusional state of individuals. Yet the results obtained indicate that ECT with the Reiter apparatus does not produce after-effects that interfere with the patients' functioning capacity to deal with the variety of complex tasks comprising this test.

As reported above, specific behavioral changes following treatment were observed. One of these, the confusion with respect to time, may be related to the so-called "retrograde amnesia" for events immediately preceding and during treatment—a phenomenon frequently mentioned in the ECT literature. Many of the subjects of this experiment displayed this condition after treatment with the Reiter machine.

Our finding that motor tapping is impaired

by electroconvulsive therapy is in line with previous findings on the after-effects of ECT on motor performance. It is the experimenters' impression that decreased scores on this test are more a function of slowed motor behavior than a result of confusion with regard to test instructions or procedure. However, a question for further investigation is raised when it is noted that Wechsler performance IQs are as negligibly affected by treatment as are the Wechsler verbal scores. The presence of a significant difference in tapping performance, when none is found in the Wechsler performance scale, suggests that more intensive research is necessary in order to clarify the specific nature of change in motor behavior following shock.

The discrepancy in results may also be explained by consideration of another independent variable—time elapsed since application of the current in treatment. It will be remembered that the orientation questionnaires and motor tapping tests were administered first following shock. Although these can be completed within 10 minutes, the fact that these 2 tests alone uncovered significant impairment of behavior suggests the possibility that confusion may be present immediately following coma from Reiter electrostimulation, this confusion clearing rapidly. This possibility is considered sufficiently real to warrant further research in which the time elapsed since treatment is handled carefully as another variable.⁵

The results of the experiment have certain implications for those working with ECT. One of these concerns the existing tendency to refrain from diagnostic testing of patients following electroshock. The findings here indicate that the tester can place considerable confidence in results of intelligence tests of the Wechsler variety that are administered shortly following initial treatment with the Reiter apparatus.

⁵ The more recent observations of K. W. Wilcox indicate that test performance is highly variable in the period immediately following coma from Reiter ECT (personal communication—September, 1951). The results from her intensive research in this area should clarify the question raised by the disparate results here.

In general, it would appear that patients are not greatly confused nor poorly oriented as a result of Reiter ECT and that they can be tested and managed in this light. However, confusion with respect to time orientation, and difficulties in motor performance, do exist. Understanding of the patient's limitations along these lines may prove useful in clinical work following Reiter Electro-stimulation.

CONCLUSIONS

A single electroconvulsive treatment with the Reiter Electrostimulator was found to have no significant effect on the Wechsler-Bellevue IQs of patients examined following this treatment. Treatment did result in poor orientation with respect to time and impaired motor performance on the Whipple-Healy Tapping Test.

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THYROTOXICOSIS FOLLOWING ELECTRIC CONVULSIVE TREATMENT¹

NICHOLAS A. BERCEL, M.D., BEVERLY HILLS, CALIF.

There are a number of studies in the literature about the effect of ECT on thyroid function, some of which, more recently, utilized the method of radioactive iodine uptake as an index of thyroid activity. Thus, Bowman(1) and his collaborators had occasion to study 24 cases before and after electric and other currently used shock treatments, and they found no significant differences in iodine uptake, with the exception of 2 patients suffering from manic-depressive psychosis in whose cases a marked drop in uptake occurred during their recovery obtained by ECT. Hemphill and Reiss(2, 3) recently have studied this problem using a similar method of investigation and they were able to show that thyroid function as a result of ECT, if it changes at all, shows a decrease. Clinical experience with a large number of patients receiving ECT is in line with these experimental findings. Hyperthyroidism following ECT is extremely rare.

In the experience of this writer with 561 cases receiving ECT during the past 10 years for functional psychoses, in only 3 cases could evidence be construed to the effect that electric shock was responsible for clinical and biochemical manifestations of pathological thyroid overactivity. Our interest in this problem was stimulated by the following case treated in 1942:

E. M., 49, white female, with negative family history for nervous, mental, and endocrine diseases developed a classical case of involuntional melancholia 3 months following a hysterectomy, performed for a fibroid uterus. When her otherwise uneventful postoperative course was rather suddenly complicated by an agitated depression, her physician did a complete diagnostic work-up, including BMR (plus 5) and blood iodine (5 mg.). She was given a series of ECTs performed every other day, and definite improvement in her psychosis was noted after the seventh treatment. At this point she became suddenly tremulous, weak, complaining of perspiration and tachycardia. A repeat blood iodine determination showed 14.2 mg. In view of the danger of a possible thyrotoxic crisis, ECT was in-

terrupted and she was given Lugol's solution, which beneficially affected her thyrotoxicosis within one week. Presently, however, she gradually relapsed into her original psychosis as manifested by depression, suicidal ideas, marked restlessness, self-accusatory and self-discriminatory ideas. It was then decided to continue the convulsive treatments, this time using metrazol. After 6 treatments the patient recovered from her psychosis. In another 3 weeks she underwent a subtotal thyroidectomy. She has been symptom-free both from the point of view of hyperthyroidism and of her psychosis for the past 8½ years.

In our belief, this case established a satisfactory cause-and-effect relationship between ECT and thyrotoxicosis, and parenthetically it drew attention to a possible difference between electric and metrazol convulsive treatment, so far as their effect on the thyroid gland is concerned. It was at this point of our series that routine laboratory studies for thyroid function before and after ECT became advisable. Of the 561 shock-treated cases, such information is available in 425 cases; therefore, the 3 cases of post-ECT thyrotoxicosis would represent a fraction of 1% of the controlled series.

The second case encountered showed a similar difference between ECT and metrazol:

I. L., 52-year-old woman, had a thyroidectomy at the age of 49, followed by complete disappearance of her thyrotoxicosis. Presently, she broke down with a typical involuntional melancholia associated with a strong suicidal tendency. Because of her thyroid history she was tested for BMR (plus 10) and blood iodine (5.5 mg.) prior to her first ECT. After the second such treatment, her blood iodine rose to 11 mg. and she began once again to exhibit the early signs of a toxic thyroid. From this point on she was on Lugol's solution during the whole, shock treatment period. She was switched to metrazol and, after 3 treatments, her blood iodine as well as the clinical manifestations quieted down. Because her only good vein became thrombosed, thus unusable for metrazol, it was decided to take another chance with ECT. After two such treatments she began to exhibit clinical thyrotoxic symptoms associated with a prompt rise of the blood iodine level to 12 mg. At this point ECT was interrupted, but the sustained disappearance of the psychotic picture rendered further treatment unnecessary. After a short course of Lugol treatment, she was

¹ From the University of Southern California, Department of Physiology. Aided by the Margaret Mayer Research Fund.

reoperated and a retrosternal thyroid residue was successfully removed. She was symptom-free in every respect for a 4-year follow-up period, when she developed a melanocarcinoma of the foot that soon metastasized all over the body leading to death after a three weeks' illness.

The third case had a very similar course, but the underlying psychosis was that of catatonic schizophrenia:

T. R., 32-year-old white male, was suffering from a toxic adenoma and was treated conservatively (Lugol's solution) preparatory to thyroidectomy for 3 weeks, with definite signs of improvement, both from a clinical and laboratory standpoint (BMR: plus 50 to plus 20; and blood iodine: 14 to 8 mg.). At this point, following a holdup next door, in which the patient was in no way involved, he suddenly developed a catatonic schizophrenia. He was hospitalized and started on ECT and, while his psychosis showed steady improvement, after 6 ECTs his thyrotoxicosis became aggravated to the point where it was originally. He was then given 7 metrazol convulsive treatments, at the end of which his psychosis showed a satisfactory remission. During these 13 shock treatments he continued to take his Lugol's solution, which seemed to have made no difference whatsoever, so far as the excitatory effect of ECT on thyroid function was concerned.

In view of the apparent better tolerance of metrazol convulsive treatment by thyrotoxics or by those who are threatened by such a condition, we had occasion to use this form of shock treatment in 2 cases of acute maniacal delirium occurring at the height of severe thyrotoxicosis where prompt sedation was indicated. This was done in conjunction with more specific attention to the underlying endocrine problem. The results were satisfactory, although one patient had a rather stormy recovery due to aspiration pneumonia, which, however, promptly responded to antibiotic therapy.

The question can be raised at this point whether the underlying psychosis and thyrotoxicosis were not in some way interrelated in the 3 cases reported above. This seems to be quite unlikely since the psychoses were typical of their stated variety, that is, 2 cases of involuntional melancholia and 1 of catatonic schizophrenia. The former 2 had no previous psychotic episodes and following shock treatment no relapse has occurred. They had minor menopausal symptoms, which have also responded to shock treatments alone. The catatonic schizophrenia case occurred in a schizoid personality who,

for a number of years, suffered from vague ideas of reference and feelings of depersonalization, never reaching the level of a full-fledged schizophrenic psychosis. It also has to be noted that psychosis and thyrotoxicosis followed an independent course in each of these 3 instances.

A further inquiry could conceivably touch upon the position of the electrodes, strength of current, and rapidity of spacing of treatments. The technique, however, was the same in all the 561 cases. The apparatus used was the conventional Offner type electroshock machine, and the maximal current given in each case was 600 ma at 0.3-0.5 second, with the electrode plates placed slightly anterior to the temporal depression of the skull. Treatment was never given more often than every other day. Cerletti(4) is known to have given, along with a number of other authors, as many as 6 treatments a day in some of his cases receiving the so-called "annihilation treatment" (with the aim of producing an organic confusion syndrome) without ever encountering a thyrotoxic after-effect.

The possibility that we were dealing here with individuals who developed a psychosis when thyrotoxicosis was incipient can be dismissed in the first case since BMR and blood iodine examinations, not to mention a thorough clinical survey, disclosed nothing abnormal in that respect. Cases of thyrotoxicosis without hypermetabolism have been described(5), but even those who object to unreserved reliance on high radioactive iodine uptake value as an index of thyroid toxicity do not question the absolute fidelity of serum-bound iodine level changes. On the other hand, the second case was euthyroid for a follow-up period of little short of 3 years, when 2 ECTs rekindled a dormant thyroid residue, while the third case was in remission from a recent thyrotoxicosis as a result of lugolization when he suffered a relapse following ECT, even while continued on Lugol's solution. Metrazol did not seem to upset the thyroid equilibrium.

It is perhaps permissible to postulate that electrical stimulation of the pituitary gland leads to an activation of thyroid function by means of increased production of its thyrotrophic element. Owing to the close ana-

tomical and functional interrelations between pituitary and hypothalamus it is difficult to speak of differentially involved pituitary effect. There can be little argument about the involvement of the hypothalamus in ECT. Both components of the autonomic nervous system are centrally (hypothalamus) excited in the convulsion. In fact, the autonomic effect far outlasts the involvement of the motor system. The hypothalamus could receive its stimulus either directly (the electric current) or indirectly through neural discharges originating from overlying structures, thalamic or cortical, primarily excited by the current. However, animal experiments have shown conclusively that direct electrical stimulation of the pituitary alone can lead to increased endocrine activity. H. A. Haterius and Ferguson(6), experimenting with rabbits, post-partum, observed increased frequency and amplitude of the uterine contractions upon electrical stimulation of the pituitary stalk, similar to that obtained by pitocin, even after spinal transection, vagotomy, and severance of both splanchnic nerves. This could have been due only to hormonal action. The fact that electrically induced increase in thyroid activity was not duplicated when metrazol was the convulsant appears to point toward a difference in the selective action of these 2 convulsants upon the pituitary. Even though the hypothalamo-pituitary area has one of the richest blood supplies in the C.N.S., the level of metrazol in the blood stream might not be enough to potentiate the thyrotrophic action of the pituitary, or its effect is simply below that of ECT. Further studies will have to supplement our small series, however, before this peculiar difference between ECT and metrazol can be safely accepted as a fact, and our preliminary report is not intended to constitute an unreserved endorsement of metrazol in thyrotoxic psychoses.

The question still has to be answered, however, as to why so few patients undergoing ECT show hyperthyroidism when literally millions of such treatments are given to patients all over the world. Of all the possible explanations, that given by Hemphill and Reiss(7) seems to be the most logical. According to these authors, ECT stimulates the pituitary to increased production of thy-

rotrophic hormone. This is ordinarily neutralized by the body's own cortisone, explaining the absence of change in thyroid activity. When, however, an individual is unable to manufacture his own cortisone, no defense against thyroid activation by the pituitary element takes place; hence an increase in thyroid function becomes noticeable clinically and/or biochemically.

We do not know enough about incipient subclinical thyrotoxicosis that could be conceived to be present in spite of normal laboratory values to include a possible unstable thyroid equilibrium in our explanation.

SUMMARY

1. Three cases of hyperthyroidism occurring in the course of or after ECT for unrelated psychoses were described.
2. This occurred in a fraction of 1% of controlled cases.
3. It is believed that individuals unable to manufacture their own cortisone are unequipped to counteract the increased production of the thyrotrophic factor of the pituitary caused by ECT.
4. Metrazol did not seem to parallel ECT in its effect on thyroid function and was successfully used in clearing up 2 cases of frankly thyrotoxic delirium.

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SUCCINYL-CHOLINE-IODIDE AS A MUSCULAR RELAXANT IN ELECTROSHOCK THERAPY¹

G. HOLMBERG, M. D., AND S. THESLEFF, M. D., STOCKHOLM, SWEDEN

The most common complication associated with electroshock therapy is fracture, especially of the vertebrae. Lingley and Robbins (1) reported fractures of 23% of their cases, Nyby (2) in 14%, and Meschan *et al.* (3) in 39%. The powerful muscular exertion during the convulsion, the anoxia (4, 5), and the rise of blood pressure (6, 7) constitute a considerable strain on the patient's circulatory apparatus. For this reason, it has at times been impossible to give this treatment, despite strong indications.

Since Bennett (8) in 1940 introduced curare as a prophylactic measure in electroshock therapy, this method has been widely used. Synthetic preparations resembling curare have also been tried. Flaxedil in particular has been much used recently (9, 10). Many writers consider curare preparations risky and unsuitable for routine application. It has not, as a rule, been possible to give sufficiently large doses to avoid fractures entirely (3). All the preparations hitherto tested have such a prolonged effect that it is necessary to anticipate respiratory failure. Therefore, the patient must be supervised for some time after treatment. The majority of curare preparations have toxic side-effects consisting of the freeing of histamine and an effect on the autonomic nervous system, resulting in bronchospasm, urticaria, and a fall in blood pressure. When prostigmine is employed as an antidote, hypersalivation frequently ensues. This, in combination with the weakened respiration, may constitute a risk. We have hitherto lacked a muscular relaxant without side-effects and with an effect of sufficiently short duration to permit its routine use in electroshock therapy.

¹ From the Psychiatric Clinic (Director: Prof. T. Sjögren) and the Department of Anæsthetics (Senior Anæsthetist: Docent T. Gordh) of Karolinska Sjukhuset and the Department of Pharmacology (Director: Prof. G. Liljestrand) of Karolinska Institutet, Stockholm.

The preparation used is manufactured by Apoteksvarucentralen Vitrum, Stockholm.

In 1949 Bovet (11) discovered the short curare-like effect of succinyl-choline-iodide (referred to in the following as succinyl-choline) but observed certain toxic effects on the circulatory system. In 1951, Löw and Tammelin (12) produced the compound in a crystalline and pure form, after which Thesleff in 1951 (13) carried out pharmacological tests.

Succinyl-choline is a strong inhibitor of neuromuscular transmission (11, 13). It is broken down in the body by esterases (11, 12), probably into succinic acid and choline, both of which are natural metabolites. This explains the short duration of its effect and its extremely low toxicity. Experiments were made on animals and on human subjects. In neither case was it possible to demonstrate any effect upon the blood pressure or otherwise on the circulatory system. This applies both to small and to large doses. No histamine-liberating effect could be noted, nor was any effect upon the transmission in the autonomic nervous system demonstrable. In experiments on man, the central nervous system remained unaffected. Further tests showed the duration of action to be a few minutes only. The individual sensitivity was found to vary appreciably, but the effect was fairly constant in the same individual. Owing to the rapid breaking down of the preparation, there is no cumulative effect even with repeated doses. Prolonged use does not give rise to functional disturbances or organic changes (Thesleff).

Succinyl-choline is administered intravenously, and has then a very rapid effect. Thus, complete muscular relaxation is obtained in man within approximately 60 seconds. When the preparation takes effect, generalized fibrillar muscular twitchings occur. This is a completely harmless phenomenon that is also associated with other substances with a similar structure. The ratio of the dose that paralyzes the skeletal muscles to the dose causing respiratory arrest is 1:2. In man, a dose of 0.3 mg per

kg of body weight gives practically total relaxation of the skeletal muscles for 2-4 minutes, without, as a rule, causing respiratory arrest.

Succinyl-choline may be used together with all common anaesthetics. Like Decamethonium, it shows a certain antagonism to other curare preparations. Cholinesterase inhibitors, such as prostigmine, prolong the duration of its effect, so that such substances cannot be used as antidote to succinyl-choline. However, the rapidity with which it is broken down and the short duration of its effect make an antidote unnecessary.

For other pharmacological data, the reader is referred to reference 14.

Method

Before our present method had been worked out, we first gave an intravenous injection of a barbiturate through a cannula. When the patient had fallen asleep, succinyl-choline was injected rapidly intravenously in a dose of 0.4-0.5 mg per kg of body weight. When the maximum effect was apparent after about 80 seconds, the shock was given. With this procedure we obtained complete muscular relaxation with none of the unpleasant sensations that always accompany a "curarization." The disadvantage of the method was that a relatively large amount of barbiturate had to be administered, and that the insertion of the venous cannula was sometimes difficult. The procedure was, moreover, somewhat time-consuming. We now use it only in exceptional cases, when it is absolutely necessary to ensure total muscular relaxation.

At present, we use the following routine method. The patient is given 0.25 mg of methylscopolamine nitrate (Skopyl) subcutaneously in the ward 30-45 minutes before the treatment.

In the treatment room the physician injects intravenously a mixture of succinyl-choline (0.3 mg per kg of body weight) and 0.15 g of Pentothal, Evipan, or Narkotal, the substances having been drawn up separately and mixed in the syringe. This mixture is injected at an even rate for 60 seconds, during which the patient inhales oxygen through a mask.

About 20 seconds after the end of the injection, the electroshock is administered. The usual dose of current must as a rule be raised by about 10-20% on account of the administration of the barbiturate.

With this dose, the convulsions are, in the majority of cases, only slight. No special arrangements are required for fixation or special position, it being sufficient to press the patient's jaws together on a wide rubber spatula. When the convulsions have ceased, oxygen is insufflated actively with the help of a tightly fitting mask and a rubber bulb, after which spontaneous respiration will, in the great majority of cases, begin within 1 to 2 minutes.

When it is evident that the patient's breathing is regular and that there is a free airway, he may return to the ward. Further supervision, in addition to that generally required in connection with electroshock, is then superfluous.

Discussion of the Method

Premedication with Skopyl(15), an atropine-like agent with a particularly strong secretion-inhibiting effect, is given to counteract the stimulation of the parasympathetic nervous system that is often caused by the shock(16, 17). The vagal stimulation gives rise to hypersecretion in the respiratory passages and not infrequently to cardiac arrhythmias(17). In view of the reduced ventilation in connection with the treatment, we consider it necessary to administer a secretion-inhibiting agent.

As a rule, the dose of succinyl-choline to be given at the first treatment has been fixed at 0.3 mg per kg of body weight. This is because this dose, both experimentally and clinically, has proved in the majority of cases to give satisfactory muscular relaxation without affecting the respiration to any marked extent. In subsequent treatments, a slight correction of the dosage is necessary in some cases (in our experience, within the limits 0.2-0.4 mg per kg). In exceptional cases the initial dose may be larger or smaller than the usual one. Thus, when there are strong indications for total muscular relaxation, or when the patient is particularly muscular, the dose may be increased. A reduction may

be motivated in cases of obesity, when the muscular mass is slight in relation to the body weight.

While the injection is being given, the patient is seen to become limp, at the same time that the ventilation is frequently diminished. Moreover, rapidly reversible fibrillar muscle-twitchings may occur. If the patient were awake, these symptoms would give rise to unpleasant sensations. We therefore mix the succinyl-choline with a rapidly acting barbiturate. The mixture is injected slowly for 60 seconds for the following reasons: (1) the paralysis does not set in so violently and is not so unpleasant for the patient; (2) the full effect of the barbiturate is not obtained in a shorter time; (3) if the barbiturate is injected more rapidly, there is a risk of laryngospasm and a fall in blood pressure.

The dose of 0.15 g of barbiturate has been chosen in view of the fact that it is the smallest quantity that in the majority of cases gives amnesia for any unpleasant sensation that may have been experienced. If it failed to have this effect, we raised the dose in the subsequent treatment to 0.20 g. With the slow rate of injection, these small doses of barbiturate cannot be regarded as toxic or as associated with any risk.

On account of the alkaline pH of the barbituric acid derivative, the succinyl-choline in the mixture will be broken down fairly rapidly. We therefore draw up the desired amount of succinyl-choline and barbiturate in the syringe immediately or at most 5 minutes before the injection.

While the injection is being given, the patient is made to inhale oxygen through a mask, to rule out anoxia during treatment. When the convulsions have ceased, oxygen is once more supplied, this time with insufflation. With this method and with oximetric control (see Holmberg and Lahne (5)) we found in 40 treatments that the oxygen saturation of the arterial blood did not fall below 90%. The duration of the convulsions is prolonged by the high oxygen saturation, so that they may last up to 2½ minutes. There is thus no anoxia, as in ordinary electroshock therapy, and the method may therefore be regarded as less of a strain

on the patient in cases of vascular or cardiac disease.

It is not, as a rule, necessary to prolong insufflation; a few breaths are often sufficient. In a few cases, however, the respiratory arrest may be of longer duration, from 1 to 5 minutes. It is necessary to have access to a cylinder of oxygen with a rubber bulb and a tightly fitting mask.

A pharyngeal and tracheal tube, a laryngoscope and suction device should also be in readiness, so that a free airway can always be ensured. We consider these precautionary measures obligatory, although we have in no case needed to have recourse to them. The physician in charge of the treatment must be familiar with the treatment of respiratory difficulties and be able to perform intratracheal intubation.

With the method here described the only staff required is the physician in charge of the treatment, a nurse, and a third person as assistant. About 7 minutes are required for each treatment.

Material

The preparation has been used at the Psychiatric Clinic of Karolinska Sjukhuset since February 1951. It has been given routinely in all electroshock treatments at the clinic, to which no violent patients or those with severe psychosis are, as a rule, admitted.

The preparation has been given to 136 patients altogether: 55 men and 81 women, in connection with 512 electroshock treatments, 228 to men and 284 to women.

The age distribution in the material is as follows:

Age group (yrs.)	Females	Males
11-20	2	0
21-30	6	7
31-40	32	15
41-50	26	14
51-60	11	15
61-70	4	4
	81	55

Using the method with a mixture of barbiturate and succinyl-choline, 108 patients were treated in connection with 439 electroshocks. This part of the material is discussed in greater detail in the following. The

diagnosis has as a rule been depression, schizophrenia or, in a few cases, psychoneurosis.

In about one-sixth of the cases special indications for the use of muscular relaxants were considered to be present. Such indications were fractures sustained earlier, pronounced changes in the vertebræ or intervertebral discs, acute back affections and, as regards the circulatory organs, myocardial damage and/or hypertension.

Results

The strength of the convulsions was graded as follows; normal, definitely reduced, and slight. "Slight convulsions" denotes that the patient was so relaxed that the limbs were not lifted from the bed.

In 13 patients the convulsive strength was, on some occasion, not definitely reduced (=normal). In 57 patients the convulsive strength varied between definitely reduced and slight. In 38 of the patients the convulsive strength was slight on the occasion of all the treatments.

After the convulsions, respiratory arrest lasted in 12 of the patients on some occasion for at least 3 minutes, the period being in 2 cases as much as 5 minutes, and in 2 cases, 4 minutes. In 14 patients, the duration of respiratory arrest was, on some occasion, at least 2 minutes and in 38 patients at least 1 minute. In 44 of the patients, there was short respiratory arrest, *i.e.*, less than 1 minute, after every treatment.

It may therefore be inferred that, in the majority of cases, the dose administered produced sufficient muscular relaxation without excessive duration. Owing to the rapidity with which succinyl-choline is broken down, the muscular force and respiration are restored within about one minute of the conclusion of respiratory arrest. In no case did the respiratory difficulties persist.

The side-effects observed during the actual treatment were the following. In 7 of the patients a mild attack of hiccoughs was noted on some occasion, but it abated spontaneously. In 1 case Skopyl was administered in error only 15 minutes before the treatment; hypersalivation resulted and ne-

cessitated pharyngeal suction. In 1 case, immediately after the first treatment, slight stridor (possible incipient laryngospasm) was observed; it subsided spontaneously. Thus, in no case were there any serious or threatening complications during the treatment.

After each treatment, the patient was questioned regarding any possible unpleasant sensations and whether treatment had been followed by any pain. Moreover, all the case-sheets were studied in view of possible complications.

Thirteen patients reported unpleasantness in the form of a choking sensation in connection with the injection. A slight increase in the dose of barbiturate subsequently sufficed to eliminate this unpleasantness. It was never necessary to discontinue treatment on these grounds, nor did any patient refuse to continue treatment.

Twenty-five patients reported slight tenderness in the jaws, which abated after a few hours. Slight generalized muscular tenderness, especially in the calves, and referred to by the patient as "training ache," was sometimes experienced. Similar phenomena have been described in connection with the use of substances showing chemical resemblances to succinyl-choline (18).

Pains in the back after treatment were reported in 2 cases. In both cases X-ray examination of the spine was made. In one of these 2 cases, in which the patient had complained of lumbar pain, the results of the X-ray examination were negative. The other patient, a 34-year-old woman, complained of interscapular pain after the fourth treatment. X-ray examination revealed slight compression of the upper surface of the third and fourth thoracic vertebræ. The strength of the convulsions had on this occasion been normal, probably owing to the fact that part of the injection had inadvertently been made paravenously. It may further be mentioned that on the occasion of the previous shock, which was administered by another physician, the patient had not been given a muscular relaxant. In both these cases we continued electroshock therapy without changing the dose. There was no subsequent unpleasantness.

CONCLUSIONS

We have hitherto been able to test succinyl-choline clinically for 6 months only. We nevertheless consider an account of the method and of the preliminary results warranted. With the method employed, succinyl-choline has proved suitable and easy to use in connection with electroshock therapy. Its effect has been definite and uniform and has permitted the desired degree of muscular relaxation. In our opinion, it is suitable for routine use according to the method described earlier in this paper. In cases in which skeletal disease or affections of the circulatory organs necessitate total muscular relaxation during treatment, this may easily be obtained by increasing the dose. By eliminating the convulsions and keeping the oxygen saturation at a normal level throughout treatment, the strain on the motor and circulatory apparatus is considerably lessened.

SUMMARY

Succinyl-choline-iodide has been used to produce muscular relaxation in 136 patients in connection with 512 electroshock treatments. A method is described in which the preparation is administered intravenously in a mixture with a rapidly acting barbiturate. The powerful and brief effect of succinyl-choline-iodide makes it possible to reduce the convulsions until they are practically negligible, without the risk of prolonged respiratory difficulties. Except for an insignificant vertebral fracture no serious complications

were observed either during or after the treatments. In the opinion of the writers, succinyl-choline-iodide is particularly suitable for routine use in connection with electroshock therapy.²

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² Since this article was submitted for publication, a further 285 electroshock treatments have been given to 78 patients. The results agree with those described. No fractures, other complications, or side-effects were observed.

MECHANISM OF SEIZURES INDUCED BY DI-ISOPROPYL FLUOROPHOSPHATE (DFP)¹

WILLIAM F. BOUZARTH, M.D., AND HAROLD E. HIMWICH, M.D.²

Army Chemical Center, Md.

It appears likely that acetylcholine functions in the propagation of the nerve impulse in the peripheral nervous system and ganglia. Feldberg(6) reviewed the role of acetylcholine in the central nervous system. He was unable to substantiate the theory of this agent's central transmission, because the theoretical approach was based on single items of evidence. Since then greater evidence has accumulated(2, 5), but the role of acetylcholine in the central nervous system is by no means settled.

Acetylcholine is hydrolyzed to choline and acetic acid by the enzyme cholinesterase. When acetylcholine is injected into the circulation its pharmacological properties are rapidly reduced. However, both the muscarinic (effects on smooth muscles and glands) and nicotinic (effects upon ganglia and voluntary muscles) pharmacological actions are potentiated by such cholinesterase inhibitors as eserine and di-isopropyl fluorophosphate(DFP). DFP has added advantage for experimental study because the inactivation of cholinesterase is irreversible (3, 15).

Freedman *et al.*(7) and Hampson *et al.*(11) have demonstrated that intracarotid injection of DFP produced electrocorticographic patterns resembling those seen clinically in epilepsy. These abnormal electrical cortical waves were found to be associated with an extreme fall in cholinesterase activity of the cerebral cortex. However, since grand-mal-like patterns did not correlate with the reduction of cholinesterase activity, Hampson and co-workers(11) were of the opinion that multiple factors were involved in grand-mal-like convulsions produced by DFP.

The thalamus (13, 19) has been implicated in the pathologic physiology of epilepsy. The caudate nucleus possesses a functional re-

lationship with the motor cortex(4). Since the location of these structures renders them accessible to experimental study in the rabbit, it was decided to record the electrical activity of these 2 areas.

A brief review of the anatomy(23) reveals that the head of the caudate overlies the medial area of the thalamus (see Fig. 1). It should be remembered that Glees(10) has demonstrated cortico-caudate fibers. Rose and Woolsey(16) have reported thalamo-limbic connections in the rabbit.

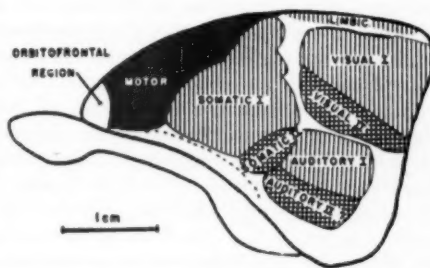


FIG. 1.—Cortical areas of the rabbit's brain as mapped out by Rose and Woolsey(17). Steel electrodes were placed in the limbic cortex and in the medial portion of the motor cortex.

The present study was undertaken in order to examine the electrical changes following DFP in the subcortical structures, as well as cortical.

METHOD

Adult rabbits ranging from 5 to 8 pounds were prepared under local (procaine) anesthesia. The femoral artery was cannulated for continuous recording of blood pressure. In one group of animals, the right common carotid artery was exposed for injection and in the other group intravenous injections were made into the femoral vein. All animals were curarized (Intocostin, Squibb) and maintained under intermittent positive pressure artificial respiration.

¹ From the Chemical Corps Medical Laboratories.

² Present address: Galesburg State Research Hospital, Galesburg, Illinois.

Small steel pins were pressed just through the inner table of the skull (12) for monopolar corticograms. These pins were so placed as to record from either the motor or the limbic cortex (Fig. 1). The electrodes from the subcortical structures were made of fine steel wire, insulated by a glass capillary tube. Only 0.5 mm of the wire was exposed at the tip. The right and left ears served as the indifferent electrodes for the respective hemispheres of the brain.

In order to place the glass-insulated electrodes in the subcortical structures a line was marked out on the skull parallel and 4 mm. to the lateral side of the longitudinal suture. One hole (a) was drilled on this line anterior to the transverse suture, a distance of 4 mm.; a second hole (b) was drilled 6 mm. posterior to the transverse suture on this same line. One electrode was inserted through hole (a) perpendicular to the plane of the skull for a distance of 10 mm. to record from the head of the caudate nucleus. The second electrode was placed a depth of 12 mm. through hole (b) to record from the medial area of the thalamus. At the conclusion of the experiment the depth was rechecked. All brains were examined grossly. The exact position of the electrodes could then be evaluated for each structure. Any observations in which the electrodes were found to be an incorrect depth at the termination of the experiment or in which the electrodes were not found to be in the subcortical structure were discarded for that particular structure.

Fresh DFP solutions were made with distilled water in concentration of 0.1%, and the solutions were discarded after 4 hours in order to avoid hydrolysis. DFP was given either 0.1 mgm/kg. every 2-4 minutes or 0.5 mgm/kg. every 6-12 minutes until convulsions or shock occurred, as determined by blood pressure readings. Injections were made either in the right carotid artery or the left femoral vein. Animal movements were controlled with additional injections of curare as required. The electrical changes were recorded continuously with a 4-channel ink-writing Grass apparatus.

RESULTS

Controls

In the unanesthetized, curarized rabbit the cortical activity, as recorded by the

method described above, consisted of aperiodic waves of a frequency of 5-7 per second and an amplitude of 200-300 microvolts (Fig. 2). Both in the limbic and motor cortices occasional areas of regularity were noted in some animals. This pattern consisted essentially of rounded waves ranging from 100-300 microvolts and lasted about one second. The motor area differed from the limbic cortex in exhibiting aperiodic bursts of spikes with a frequency of 8-12 per second and amplitude of 200-400 microvolts. These bursts ranged from 0.5-1.5 seconds in duration.

The thalamic recording with glass-insulated monopolar electrodes was similar to that of the cortex. The mean voltage of

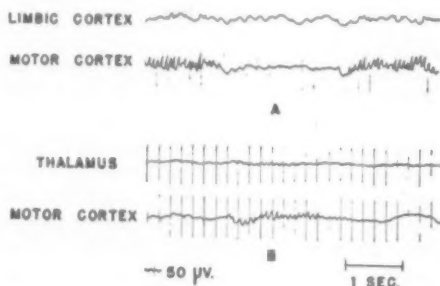


Fig. 2.—Control tracings from the limbic cortex, motor cortex, and the thalamus. Note the motor cortical bursts of spikes in A. Part B demonstrates similar and simultaneous activity between the thalamus and the motor cortex.

the thalamic waves varied from animal to animal with a range of 100-300 microvolts. No bursts of spikes were observed but areas of regularity were noted, and generally this occasional regularity was simultaneous with the motor cortical bursts of spikes but of shorter duration (Fig. 2, B). Essentially, the caudate pattern was that of the thalamus, and it exhibited as much variability. However, the areas of regularity in the caudate nucleus were not simultaneous with the motor cortical spikes.

Early Changes

The first notable change in the electrical activity was that of regularization in which there was only slight alteration in mean voltage and frequency—each regular rounded wave being the approximate size of its neigh-

bor. In low dosages the regularization was temporary, but with increasing amounts of DFP the change became permanent. The bursts of spikes seen in the control recordings from the motor cortex disappeared when this area developed regularity.

The thalamus was the first of the 4 structures previously mentioned to exhibit regularity. Very little time difference was noted between the limbic and motor cortex in show-

tion. Grand-mal-like seizure patterns were observed in all 4 areas. The spikes recorded from the caudate nucleus and thalamus were of higher voltage and lower frequency than in the cortex. These seizures lasted only a few seconds in duration, being replaced by large slow waves. However, after a seizure was once observed, it was recurrent in nature and would appear again at random.

A frequent but not invariable pattern of

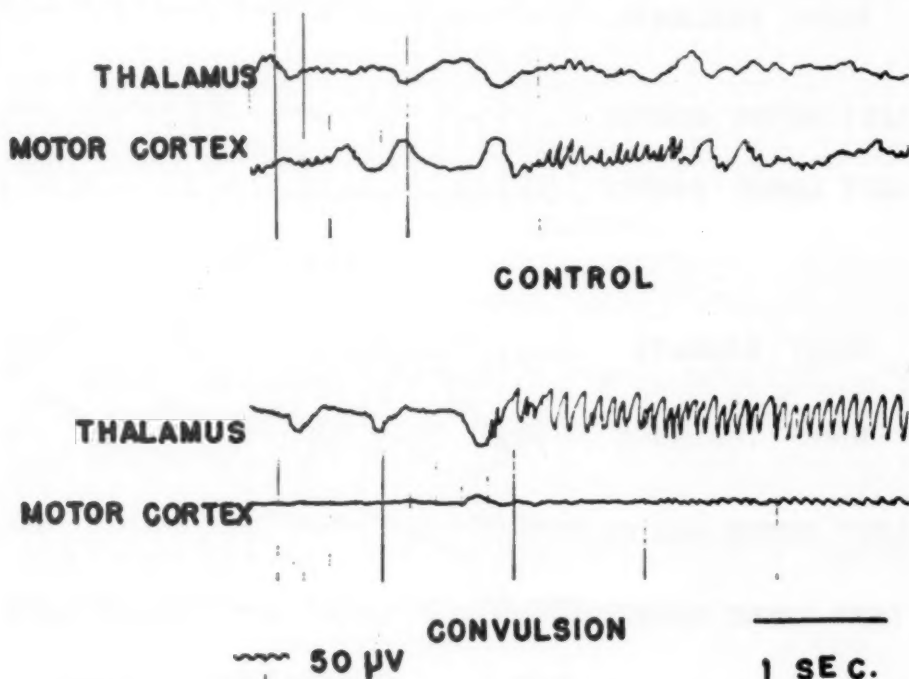


FIG. 3.—Convulsive spikes originating in the thalamus without hyperactivity in the motor cortex.

ing this change. The caudate was usually the last to do so. In fact, caudate regularity may not occur at all. The duration of the period of regularity before the next change varied greatly from animal to animal.

Convulsant Brain Waves

Depending on dosage schedule regularity was replaced by hyperactivity as manifested by patterns resembling grand mal and petit mal, according to the Gibbs' (9) classifica-

development was as follows: the thalamus was the first structure to develop the fit (Fig. 3). The caudate nucleus or the limbic cortex was the next to be affected, and the motor cortex seemed least susceptible, being the last to develop the seizure. The order of appearance, stated above, was usually observed, but this sequence was not invariable.

After grand-mal-like activity had once started there was more unified activity of the 4 areas, and this type of seizure would appear in several areas at the same time. As

previously mentioned, the motor cortex was the last area to exhibit grand-mal-like patterns and generally only when the thalamus, caudate nucleus, and limbic cortex showed spike patterns simultaneously (Fig. 4).

Status-Epilepticus-like Brain Waves

Another type of hyperactivity was similar to that seen in the corticogram of patients with status epilepticus. It was observed in all the 4 areas. The pattern was quite vari-

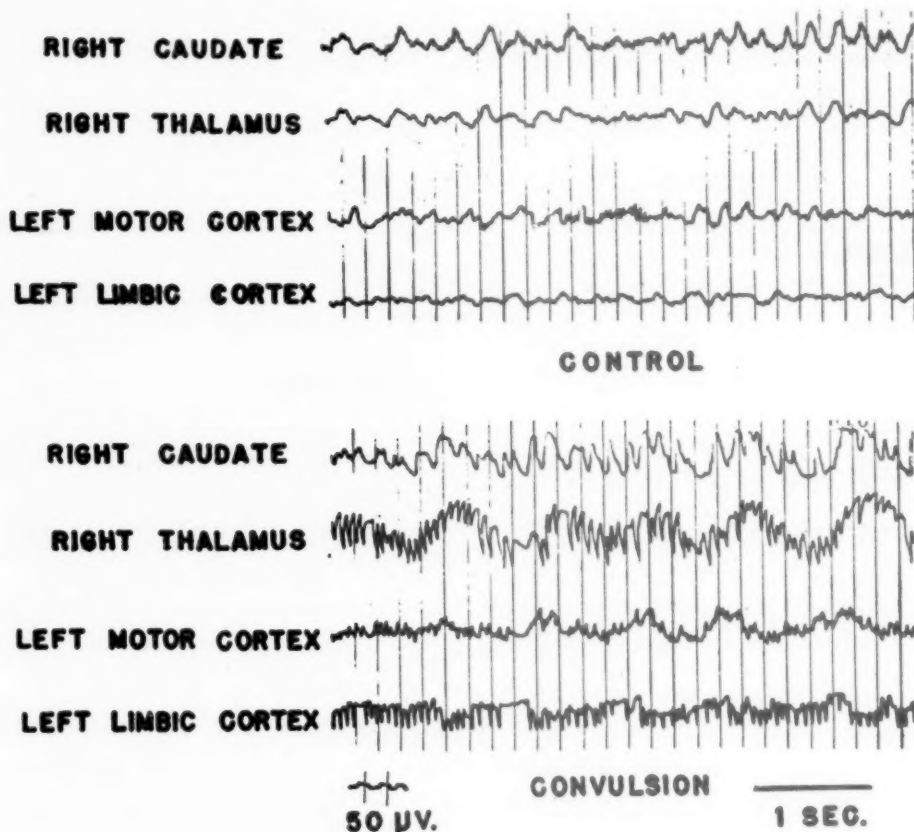


FIG. 4.—Convulsive activity in the thalamus, caudate nucleus, motor and limbic cortices. In the genesis of these convulsions the left motor cortex was the last to be involved.

A frequent observation was simultaneous activity between the caudate nucleus and motor cortex. In Fig. 5 it can be seen that these 2 areas exhibited large slow waves in close harmony. The thalamus and limbic cortex also showed simultaneous activity. However, the electrical activity of these latter 2 areas (Fig. 5) was of greater magnitude as manifested by rapid spikes.

able, but it consisted generally of large slow waves ranging from 300-500 microvolts with a frequency of 1-5 per second. Between the waves or superimposed on any part of them, single spikes or bursts of spikes were noted that resembled myoclonic seizures of human epileptic patients consisting of high frequency spikes interspersed between less abnormal tracings. These spikes were gen-

erally monophasic and of variable polarity. This status pattern was subject to sudden interruptions by isoelectric areas or areas of low voltage regularity. The duration of this isoelectric change was 0.5 to 5 seconds.

riod in which both sides of the brain exhibited hyperactivity, usually of the large slow wave pattern. When intravenous injections were given, especially 0.1 mgm/kg. the various changes in the brain with the increas-

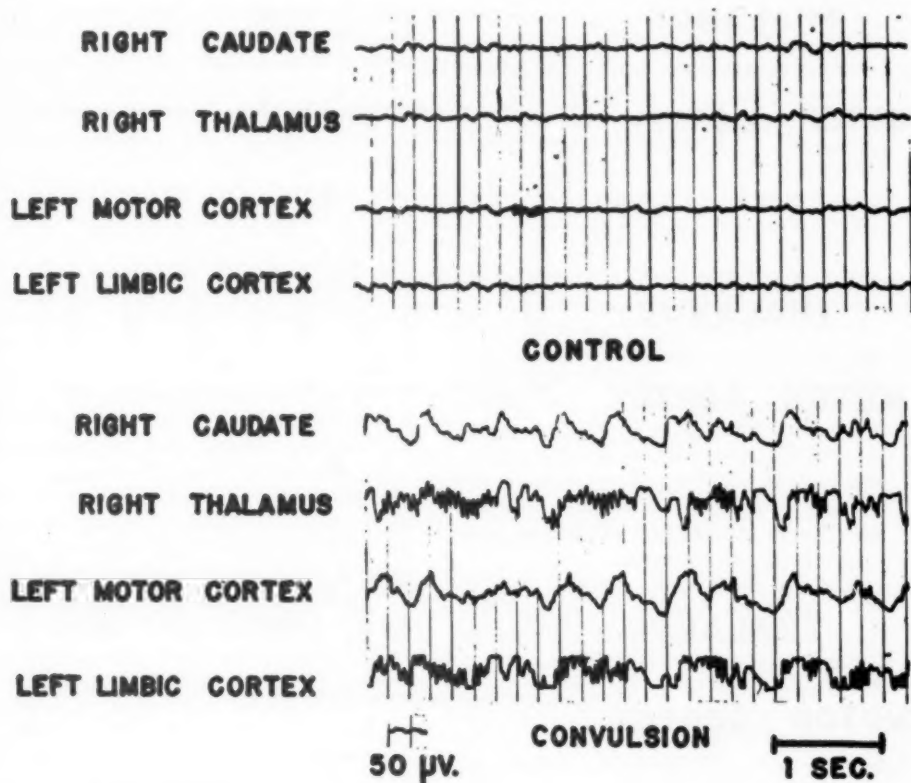


FIG. 5.—Large slow waves in the right caudate nucleus and the left motor cortex; convulsive spikes in the right thalamus and the left limbic cortex.

Spike and Dome Patterns

Spike and dome patterns closely resembling those observed in patients with petit mal epilepsy were occasionally seen, more frequently in the thalamus (Fig. 6). This pattern also appeared at random and usually they became more rapid giving way to the frank spikes of a convulsion.

With intracarotid injections of DFP the structures on the ipsilateral side were first to show the early changes. However, grand-mal-like seizures generally followed the pe-

ing doses were more likely to be distinct from each part.

A depressant phase was observed to follow convulsant activity in some animals, and could manifest itself at any time. It differed from the isoelectric areas that suddenly interrupted the status pattern in that there was a progressive decrease in the voltage of the waves until activity was practically abolished. Depression was readily seen when shock was present; however, in some animals the depressant period was seen without shock.

Whenever depression occurred, either with or without shock, all 4 areas of the brain became depressed together. However, the earliest change was noted in the cortex.

since rapid intravenous injections of curare produced generalized vigorous spontaneous movement, 3 noncurarized, nonanesthetized animals were prepared for cortical record-

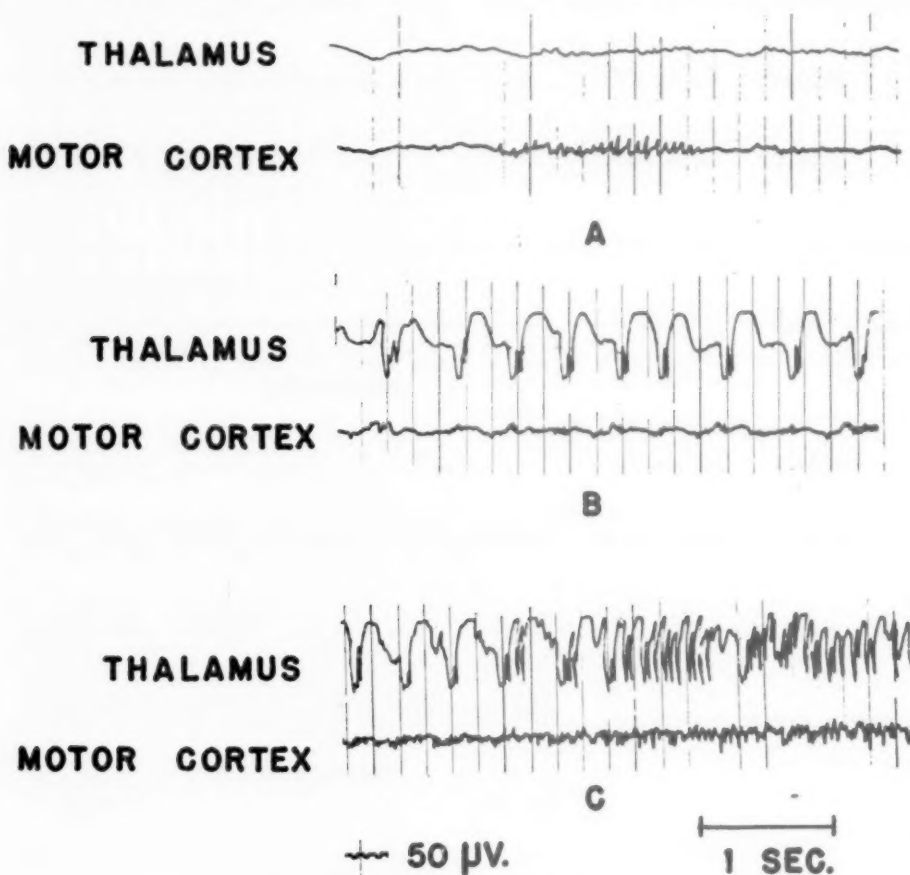


FIG. 6.—Thalamic and motor cortical control tracings in A. Spike and dome patterns in the thalamus (B), which became more rapid and developed into frank spikes (C) in both the thalamus and the motor cortex.

DISCUSSION

Controls

The bursts of spikes noted in the motor cortex were an unexpected observation (Fig. 2). A review of the literature did not disclose their etiology. As this aperiodic activity was seen in the relaxed animal under curare it probably was not an artifact of muscle potentials. Smith *et al.* (18) reported no cerebral effects of d-tubocurarine, but

ings. The spikes were still present and no noticeable muscular movements were observed to correlate with these motor cortical bursts. Since similar and simultaneous activity of a lesser degree occurred in the thalamus, these spikes may be a reflection of thalamo-cortical coordination. However, with low doses of DFP it was possible for the thalamus alone to exhibit regularity without effect on these cortical bursts. If these bursts

indicate motor cortical activity, it may be that the stimulus was blocked at a lower level.

Convulsant Waves

Perhaps the most striking observation resulting from this investigation was the response of the thalamus. In most animals the thalamus exhibited a change in regularity and grand-mal-like waves before the caudate nucleus, limbic and motor cortices (Fig. 3). This indicated that the cells of the thalamus were most susceptible to DFP-evoked convulsions. However, it should be remembered that the spinal cord may undergo seizures before the brain, according to Wescoe and Green(21). A convulsing spinal cord would bombard the thalamus with neural impulses from the stimulated posterior horn cells. If it is true that the resultant pile-up of acetylcholine by anticholinesterase drugs is the mechanism for convulsive activity, then a way station for spinal sensory impulses like the thalamus would have a greater accumulation of acetylcholine. The thalamus in turn would bombard the cerebral cortex. This seems especially likely as a result of the work of Magoun(20), who demonstrated reticular activation of the cortex.

It has been observed clinically that patients with a history of convulsions may have normal electrocorticograms between seizures (1). On the other hand, patients may have an abnormal pattern without the history of fits. Moreover, interseizure patterns may be similar to those observed when an actual seizure is taking place(9). In this series, recordings from the cortex frequently exhibited only the early change of regularity, though a thalamic convulsion was occurring at that time. In fact, grand-mal-like seizures may take place in the thalamus and/or the caudate nucleus without the motor cortex entering into the process, although some lesser degree of cortical hyperactivity may be present. Thus, subcortical convulsions without a cortical component from DFP are in agreement with the above clinical observations.

In considering the convulsant spikes appearing in the motor cortex there are 2 points of importance: (1) The motor cortex had

the highest threshold of the 4 areas for DFP-induced seizures, being the last structure to become involved. The prerequisite of seizure pattern in parts of the brain other than the motor cortex could explain the aura that precedes grand mal fits in 50% of patients with epilepsy(22), for the sensory, motor, and other areas may be involved before the generalized major convulsion develops. (2) When the motor cortex was engaged in a spike pattern, the other 3 areas were also hyperactive (Fig. 4). Hence, it appears that grand-mal-like seizures of the motor cortex produced by DFP depend upon a functional unity with other parts of the brain.

The caudate nucleus and motor cortex quite frequently demonstrated simultaneous activity (Fig. 5). This correlation of activity brings suggestive support for the functional relationships between the 2 structures. This possibility was suggested by the earlier work of Dusser de Barenne and McCulloch(4). Glees(10) has been able to demonstrate a pathway between the caudate nucleus and cortex by special staining technique. A similar pathway seems to be functional in the rabbit. As noted above, subcortical hyperactivity without a cortical component has been observed, and hence it seems likely that this simultaneous activity is not a volume conductor artifact. Future experimental study including the use of bipolar leads and microscopic examination will be needed to confirm this as a functional pathway.

As can be seen in Fig. 5 the thalamus and limbic cortex exhibit simultaneous activity. This thalamo-limbic coordination is important in view of the work of Rose and Woolsey(16), who demonstrated thalamo-limbic connection, but further investigation will be needed to correlate the anatomical findings with the physiologic observation.

Spike and Dome Patterns

Freedman and co-workers(7) have demonstrated many DFP-induced electrocorticograms that resemble those seen clinically in epileptic patients. These workers were unsuccessful in demonstrating petit-mal-like patterns; however, they recorded from the limbic cortex and visual cortex. On the

other hand, in the present investigation occasional spike and dome patterns were observed in the thalamus (Fig. 6, B). In one animal the motor cortex exhibited this pattern. In Fig. 6, C, the spike and dome arrangement gave way to a convulsant pattern both in the thalamus and motor cortex. Such a relationship between spike and dome patterns and convulsant spikes is indicated by the work of Gastaut (8).

Jasper and Droogleever-Fortuyn (14) demonstrated the influence of the thalamic intralaminar system on cortical activity. Thalamic stimulation produced cortical petit mal waves both during the period of stimulation and as an after-discharge phenomenon (13). Spiegel and Wycis (19) have had some success in the treatment of petit mal epilepsy by thalamectomy. Our observations also indicate that the etiology of petit mal epilepsy may depend upon pathological process in the thalamus, or other areas in the subcortex, rather than in the cortex.

In a small number of animals, which did not go into shock before the termination of the experiment, there was a slow depression of the convulsant activity to the isoelectric level. This depression may be the result of a great concentration of acetylcholine (nicotinic depression) and would correlate with the recent observation of Essig (5) lending more support to a central transmission mechanism of acetylcholine.

SUMMARY

1. A simple method for electrical recording from the caudate nucleus and thalamus in the rabbit was described.

2. The control tracings from the limbic cortex, motor cortex, caudate nucleus and thalamus consisted of aperiodic waves with a frequency of 5-7 per second and an amplitude of 200-300 microvolts. The motor area was interrupted with short bursts of higher amplitude spikes (8-12 per second).

3. DFP was capable of evoking seizure patterns in all 4 areas, and usually in the following order: (a) thalamus, (b) caudate nucleus, (c) limbic cortex, and (d) motor cortex.

4. The motor cortex had the highest threshold and most frequently exhibited seizure

waves when the other 3 areas were simultaneously engaged in hyperactivity. These facts suggested the necessity of a functional unity of the 4 cerebral areas for the participation of the motor cortex in seizures and may also explain the aura that precedes the attack.

5. Simultaneous activity between the caudate nucleus and the motor cortex suggested functional connections between these 2 areas. For the same reason the thalamus and limbic cortex appeared to have a physiologic relationship.

6. Spike and dome patterns were observed, most frequently in the thalamus. In some animals thalamic petit-mal-like patterns developed into frank grand-mal-like spikes.

7. Depression of convulsant activity without apparent shock suggests the depressant effect of acetylcholine in a concentration greater than that required for hyperactivity. This offers theoretical evidence for central transmission of acetylcholine.

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CASE REPORTS

ADVISABILITY OF UNDERTAKING PSYCHOTHERAPY AGAINST THE WILL OF THE PATIENT

ROBERT P. ODENWALD, M. D.,¹ WASHINGTON, D. C.

The advisability of a judge's granting a probation period, only if accompanied by a course of psychotherapy, and the effectiveness of such treatment undergone unwillingly, are answered in this history of a 17-year-old boy who received such a sentence. He had been put on probation the first time he stole an automobile but, when he repeated the crime, the proviso of psychotherapy was added to the probationary period.

The boy was unpleasant in appearance, sullen, negativistic, without emotion, extremely untidy in person and clothing. He tried to shift his guilt to the car owner because he had left the keys. He resided with his father and paternal grandmother, while his mother, divorced and alcoholic, lived in a distant city. His mother had always been a heavy drinker, careless of her morals, neglectful of and unkind to her children. In the early morning hours he used to hunt for her in saloons, sometimes finding her in compromising situations. Bitterly denouncing her, yet he placed much of the blame for her conduct on his sanctimonious grandmother and his weak father. After a few interviews he admitted that he loved her and wished she were different. He had much faith in his father's ability to "fix" things and resented the fact that he had failed him this time. He declared he liked no one, had no friends, believed in none. He disparaged the probation officer, the police, and the judge. For himself he wanted money and the power to revenge. He wanted to be a dictator and kill those who disobeyed him.

After one month's interviews and just before final examinations he was "kicked" out of school for truancy. Later, he confessed

he had again taken a car "for a ride" as before, but had not been caught. At the eleventh interview he was extremely hostile to the therapist but, after a barrage of accusations, he began to relate his experiences. He had a tremendous fear and anxiety that he had been trying to conceal. He realized now, for the first time, that he could express his thoughts to someone. In the next few interviews he melted, wept and wet himself. He still was extremely untidy in his appearance. He became close to the therapist, expressed his loneliness, and began to relive his early childhood, the most satisfying part of his life. However, after each interview, he again withdrew his confidence.

His behavior changed after the twentieth interview: he was now cleaner, able to smile, and more sympathetic in attitude. He described his fear of failure in life and of dying. He admitted there are a few good people in the world. After his expulsion from school he had been discharged from a number of jobs because of irregularity and disobedience, but at last he had held a job for 6 months on the railroad.

A month before his probation time expired, he failed to come for further interviews. He had been seen 36 times in the 15 months. Six months later his father phoned that his son had finished school and still kept his job. He was now much improved although the 36 interviews could be considered only as preparation for intensive therapy. Recently he applied for psychiatric help of his own free will. He had developed an agoraphobia (fear at the thought of being alone in large spaces), which made him seem more like a human being. Evidently, psychotherapy given against the patient's will had been justified.

¹ Director, Child Center, Catholic University of America.

HISTORICAL NOTE

JOHN CONOLLY AND THE INTRODUCTION OF NONRESTRAINT IN PSYCHIATRIC TREATMENT

EDWARD PODOLSKY, M. D., BROOKLYN, N. Y.

Just as the name of Phillipe Pinel is associated with the introduction of the humane treatment of institutionalized psychotics in France, so is the name of John Conolly remembered in English psychiatry as the man who introduced nonrestraint in England. John Conolly was born in Lincolnshire in 1794. While still in his teens he paid a visit to a mental hospital in Glasgow and was so impressed with what he saw there that he never afterwards ceased to take the deepest interest in abnormal mental and emotional behavior.

When he was eighteen Conolly became an officer in a militia regiment, in which capacity he served for several years. He married the daughter of Sir John Collins in 1816 and went to live in France. Very shortly thereafter he decided that medicine was to be his life's work and in 1817 became a student at Edinburgh University. After receiving his M. D. degree he began practice at Chichester where he remained a very short time. In 1823 he removed to Stratford-on-Avon, where he engaged in literary activity in addition to his medical practice. He wrote many of the articles as well as took part in editing the "Cyclopedia of Practical Medicine" as well as the *British and Foreign Medical Review*. At Stratford he became alderman and later mayor, established a public dispensary, and in addition became an enthusiastic student of Shakespeare. He later took an active part as chairman of the committee formed for the purpose of preserving Shakespeare's tomb.

In 1827 Dr. Conolly was appointed professor of the practice of medicine in London University, which appointment he held only for 4 years. Finding life as a London physician not quite to his tastes, in 1831 he decided to leave London for a country practice, and he settled in Warwick.

During all this time Conolly was intensely interested in mental diseases. He had studied psychiatry both abroad and at home, and had been for 5 years (while residing in

Stratford) inspecting physician to the Lunatic Houses for the County of Warwick, an office that he resumed when he settled in Warwick. He had unsuccessfully proposed to the council of the University that he should give his pupils clinical instruction in psychiatry in one of the mental hospitals in London. "Thus," says Sir James Clark in his biography of Conolly, "clinical instruction in mental diseases was thrown back for thirty years in this country."

In 1830 Conolly published *An Inquiry Concerning the Indications of Insanity, with Suggestions for the Better Protection and Care of the Insane*. In this book he discussed the clinical manifestations of the various psychoses and indicated humane methods of care and treatment. He described the deplorable conditions found in mental hospitals at that time and the woefully inadequate methods of treatment. He proposed that the State assume the responsibility of treating mental diseases. He was among the first to state that mental illness was increasing because of the increased pressures and tempo of modern life.

His book was not received with too great enthusiasm. Unfortunately at that time the average physician and even those who specialized in the treatment of mental ailments knew very little about diseases of the mind, and in addition they cared very little. So Conolly was left to his country practice at Warwick, interrupted by one year's residence at Birmingham, till 1839, when he was appointed resident physician to the Middlesex County Asylum at Hanwell, at that time the largest in England. He had taken the opportunity of visiting the Lincoln Asylum and thoroughly surveyed conditions there. He was now convinced that mechanical restraint was not only unnecessary, but injurious. He succeeded in convincing others that his system was the right one. Hanwell had the reputation of being one of the best managed asylums in England, many patients being occupied in agricultural and other useful pur-

suits. Yet the year after Sir William Ellis's resignation, when Conolly took office, "instruments of mechanical restraint of one kind or another were so abundant in the wards as to amount, when collected together, to about six hundred, about half of them being handcuffs and leg-locks."

Conolly entered upon his duties June 1, 1839. The hospital then contained 800 patients, and he found 40 under continuous mechanical restraint. In his first report to the Quarter Sessions, he informed the Justices that since the 21st of September not one patient had been under restraint. "No form of strait waistcoat, no handcuffs, no leg-locks, nor any contrivance confining the trunk, or limbs, or any of the muscles, is now in use. The coercion chairs, about forty in number, have been altogether removed from the wards." In fact, they had been cut up to make a floor for the carpenter's shop.

This was not accomplished without overcoming quite a few obstacles. It took time to indoctrinate the ward physicians and attendants. In 10 years not one case was admitted to Hanwell in which mechanical restraint was deemed necessary, although many suicidal patients were among them. "The great and only real substitute for restraint is invariable kindness," said Dr. Conolly. "This feeling must animate every person employed in every duty to be performed."

At the end of 10 years the nonrestraint system that he had introduced was so firmly established that Dr. Conolly felt he could resign as resident physician. He became visiting physician. His interest in the patients under his care was thorough. He would visit the wards at all hours of the night. He treated his patients with the greatest consideration, always looking for something to commend in a patient, the hair better kept, the clothes more neatly worn, encouraging the patient at the progress made toward recovery.

In 1852, on his resignation as visiting physician, Conolly's connection with Hanwell practically ceased, and a portrait of him painted by Sir W. Gordon was presented to him at a public meeting by Lord Shaftesbury.

His resignation from Hanwell did not mean that Dr. Conolly would resort to a life of ease. In fact, his activities increased. He aided in the establishing of several hos-

pitals for mental diseases and mental deficiency and lectured quite extensively on psychiatric topics to medical men. In addition he had a large psychiatric practice, being recognized as one of the leading psychiatrists in England.

In 1856 he wrote one of the classics in English psychiatric literature, *The Treatment of the Insane Without Mechanical Restraint*. This was widely read and proved a great influence in altering the treatment of the mentally ill along more humane lines. Also, for a number of years he was a very popular lecturer at the College of Physicians and at the Royal Institution, his courses in psychiatry being well attended by physicians who helped to spread his doctrines into almost all of the English mental hospitals. He was among the first psychiatrists to write on child psychiatry, and his papers on this subject attracted a great deal of favorable attention.

As mentioned above Dr. Conolly became interested in Shakespeare quite early in his career, and he was the first psychiatrist to write a psychiatric evaluation of Hamlet. His paper was called *A Study of Hamlet*, in which he sought to prove that Hamlet was not feigning insanity, but was actually suffering from a definite psychosis. As to Hamlet's treatment of Ophelia in Act II, Scene I, and more especially in the scene where Hamlet and Laertes met over her grave, he says: "The picture of madness here is too minutely true, its lights and shades are too close to nature to have been painted as a mere illustration of feigning, and of feigning without intelligible purpose."

In his late sixties Conolly was subjected to attacks of neuralgia and chronic arthritis. He retired from practice and he took up residence at Lawn House, Hanwell, where he could be near the hospital where he had accomplished his most notable work. He grew progressively weaker and found it very difficult to complete several papers and records of his experiences on which he had been working. On March 5, 1867, he suffered a cerebral hemorrhage that proved fatal in a few hours. Although not as well known as Pinel, Conolly, nevertheless, accomplished just as much for the humane treatment of the mentally ill as anyone in the history of psychiatry.

COMMENT

FOURTH INTERNATIONAL CONGRESS ON MENTAL HEALTH

The Fourth International Congress on Mental Health was held in Mexico City, December 11-19, 1951. It was more than a scientific meeting, more than a cultural and artistic treat by genial hosts, although it was these also. True to the tradition of the World Federation for Mental Health, it was a stimulus and challenge in two inadequately exploited areas: (1) mental health and human relations at the international level and (2) interdisciplinary collaboration of psychological and social scientists.

Psychiatrists, psychologists, anthropologists, sociologists, social workers, teachers, doctors, nurses, and others participated. Representatives, although predominantly from the Americas, came also from distant countries, *e.g.*, Israel, India, Australia, and South Africa. Russian delegates, present for the first time at a W.F.M.H. meeting, were extended a warm welcome, and a lively interest was shown in their papers on Pavlovian contributions and mental health facilities in U.S.S.R. The working group headed by Drs. E. E. Krapf and F. J. Curran on "Mental Health and Religion" was the first conference on this subject in a Latin American country.

A few aspects of the W.F.M.H. give it potentialities for being the greatest current force for frank international understanding and amity. As a scientific body its deliberations are controlled by objective methodology. As a nongovernmental body it tends to be free of the limitations of national bias and aggrandizement. As an interdisciplinary body it has access to all available knowledge on mental health and human relations. As a sizeable body it contributes no mean number of individuals interested in international problems. Perhaps it is more than the naivete and wishful thinking of the psychiatrist that attaches such profound significance to this organization.

The scientific program consisted of 7 plenary sessions, 15 technical sessions, and 18 discussion groups. The official languages were English and Spanish. One can give only a glimpse of the scientific sessions. Dis-

cussions common to mental health programs, although in many instances said better than before, are being by-passed for reference to material peculiar to the interdisciplinary and international scope of W.F.M.H.

Mexico, itself a country of tremendous contrasts, combining the most modern and the most ancient in its people and its culture, in its art and in its science, served as host to discussions of socio-cultural influences in psychopathology at the frontier of modern psychiatric thinking. Eric Fromm said that any culture must be judged as it fulfills the function of making man more human. Fulfillment of man is the major purpose of society; the peculiarity of man, rather than his uniformity, and active responsible participation of man in social and political life need stressing. Jules Henry, in a contribution on child-rearing and the cultural pattern, said the human being does not "meet the natural world directly as do other animals. His culture as a dynamically inter-related system of ideas, technologies and social organization mediates between the individual and the natural world." Since modes of childrearing represent an attempted adjustment to the environment, efforts to change them meet resistance. Conversely, any attempts to change other aspects of people's adjustment, *e.g.*, social institutions, meet with inertia of the personality, which has the previous adjustment ingrained in its foundation.

Otto Klineberg said the distorted personality of prejudiced persons, based on inability to handle their own problems of authority and security, resulting in unreal concepts of their own worth and the worth of individuals, was an important factor in racial prejudice and tension between nations.

Oscar Lewis, in a presentation on the effects of technical progress on mental health and rural populations, referred to studies indicating that rural areas contribute just as much crime, delinquency, and mental illness as do urban centers. Technical advances potentially contributing to happiness not infrequently create social disorganization with greater anxiety for man. Witness the dis-

covery of atomic energy. The disruption often following the introduction of technological advances in underdeveloped areas might be prevented if some anthropologic principles were more generally appreciated, such as the following: (1) every culture is a unity and change in any one aspect will have repercussions in other aspects, (2) disruption of social organization often reflects itself in personality disorganization of the individual, and (3) contemplated changes should have the fullest possible consent, discussion, and actual participation of those groups involved. In this way common difficulties encountered in the past can be avoided, such as medical advances and decrease in infant mortality resulting in overpopulation; stimulation of higher standards of living than the wealth of the area can support; promotion of increased leisure with inadequate preparation for substitutive constructive activities.

The discussion groups—one of the mainstays of the W.F.M.H. wherein are forged many of its precepts and resolutions—were limited to 15 members and served as workshops for participants from different disciplines and different nations. Recommendations from these groups and from the interdisciplinary Professional Advisory Council of the W.F.M.H. will be digested by the Executive Board, appear in the annual report, and may find widespread expression in the activities of the international agencies, WHO, UNESCO, and Ecosoc, or in national governmental and nongovernmental agencies. Thus W.F.M.H. makes available through its consultative capacity to the international and national governmental agencies a service not of an isolated number of such specialists

as these agencies might well employ themselves, but the composite thinking of mental health experts and social scientists throughout the world. The work of these disciplines receives, at times, financial support and widespread dissemination through these agencies. (The W.F.M.H. has undertaken research under contract with UNESCO and WHO.) A draft memorandum on the teaching of mental health in the medical curriculum, prepared at the request of the W.F.M.H. by Professor Douglas R. MacCalman of Leeds University, for the Fourth World Health Assembly in Geneva in May, 1951, proved a valuable contribution to the discussions in Mexico.

Flawless weather enhanced the beauty and culture of Mexico City with the lovely meeting places, the opera house with its famous murals and the new social security building, a study in modern architecture. The native dancers, the Indian singer and the orchestra at the opening sessions, the general reception and repast of the Secretary of the Interior, the luncheons and the excursions, the ballet and "Las Posadas"—were all expressive of the cordiality of our hosts.

Dr. H. de B. B. Roxo, of Brazil, was an excellent president for the Congress. Mexico was honored by the presidency of the W.F.M.H. in the person of Dr. Alfonso Millan. Dr. Leo Bartemeier was unanimously elected to the Executive Board of the W.F.M.H. Adequate acknowledgment for the preparations of the meeting would not be complete without commendation of Dr. J. R. Rees, Director, and Miss E. M. Thornton, Secretary of the W.F.M.H., and Miss Helen Speyer from the N.A.M.H.

EUGENE ZISKIND, M.D.

MEDICAL RESEARCH PROMOTED

It is pleasant to record that the legislature of New York State has at last passed a bill that authorizes requisitioning animals from public pounds for medical research. The favorable vote was substantial: in the assembly 103 to 40; in the Senate 34 to 18.

This bill has been repeatedly before the legislature and each time has been defeated by a lobby conducted by aggressive, sincere, sentimental persons sometimes disrespectfully referred to as "Auntie Vivies."

The necessity for animal experimentation under humane laboratory conditions, if medical science is to advance, and the increasing need of animals for this purpose in developing new and better therapeutic measures, are so obvious and have been set forth so clearly and so often that they should carry conviction, one would think, to any relatively unprejudiced mind.

The recent action at Albany is an encouraging sign that progress in this area of human and humane endeavor is still possible.

NEWS AND NOTES

FIRST INTERNATIONAL CONGRESS OF NEUROPATHOLOGY.—Announcement of this Congress convening in Rome September 8-13, 1952, appeared in the October 1951 number of this Journal. A more detailed program has now been completed including speakers from the United Kingdom, Germany, France, Belgium, Netherlands, Switzerland, Italy, Norway, Portugal, Spain, India, Peru, Uruguay, Brazil, Australia, New Zealand, Cuba, Canada, and the United States. Further information may be obtained from the Secretary General, Dr. Armando Ferraro, 722 W. 168th St. New York 32.

GRADUATE COURSE IN PSYCHIATRY AND NEUROLOGY, UNIVERSITY OF CALIFORNIA SCHOOL OF MEDICINE.—This 10-weeks course (Aug. 25-Oct. 31, 1952), given by the Division of Psychiatry, is a repetition of the course given previously and is open only to qualified physicians.

Instruction will be under the direction of Dr. Karl M. Bowman, professor of psychiatry, University of California School of Medicine, with the assistance of staff members from the various divisions of the Medical School. The hours will be Monday through Friday, 9 a. m. to 5 p. m., with some special work on Saturdays, 8 a. m. to 10 a. m., for part of the time.

The course will be a general but comprehensive review of psychiatry and neurology, with material from related fields in medicine. It is particularly designed to prepare psychiatrists and neurologists for taking the examinations of the American Board of Psychiatry and Neurology. The course is, therefore, designed for the advanced student in psychiatry and neurology rather than the beginner. A special endeavor is made to present the latest knowledge and advances so as to make the student familiar with the most recent developments in psychiatry and neurology.

The fee is \$200 payable in advance to the Regents of the University of California. Application, including fee and biographical

data (place of legal residence, medical school attended and year of graduation, training and experience in psychiatry) should be sent to Dr. Stacy R. Mettier, professor of medicine, head of postgraduate instruction, Medical Extension, University of California Medical Center, San Francisco 22, Calif. Further details may be obtained from that office or from the Langley Porter Clinic.

University Extension reserves the right to cancel this course, in which case all fees will be refunded. The course will not be given for less than 25 registrants.

PATIENTS' ART EXHIBITED.—Paintings by patients at Saint Elizabeths Hospital were on display at the Federal Security Building, Washington, D. C., from February 29 to April 11. The work was done under the direction of art therapist Prentiss Taylor. The exhibit of 50 pictures will be circulated at a later date.

Mr. Taylor, in discussing the purpose of art in therapy, in a foreword to the catalogue accompanying the exhibit, states that little attention has been paid to what the creative experience in itself can mean to the patient. "The therapist sees what he can get the patient to do for himself, not how much he can do for the patient. He furnishes a means and hopes for a response." Mr. Taylor guards against speculative interpretation and carefully avoids reading in.

RESEARCH SYMPOSIUM ON CEREBRAL PALSY.—Nine significant phases of the treatment of cerebral palsy were discussed by eminent physicians and surgeons from various centers in the United States and Canada at the Third Symposium conducted by the Research Council of United Cerebral Palsy, on March 28, 1952, at the Academy of Medicine, Cleveland. The general theme of the symposium was "Appraisal of Current Methods of Treatment of Cerebral Palsy."

Two symposiums were arranged last year by this Research Council, which is headed by Dr. Sidney Farber, of Harvard Medical

School and Children's Medical Center, Boston. The first, on "Basic Research," was held at the New York Academy of Medicine, and the second, on "Clinical Research," was conducted at the Philadelphia County Medical Society.

CHILD CARE UNIT, MICHAEL REESE HOSPITAL.—Dr. Roy R. Grinker, director of the Institute for Psychosomatic and Psychiatric Research and Training of Michael Reese Hospital, announces that in addition to its already existing nursing divisions for the care of all phases of adult psychiatric and psychosomatic problems, the Institute opened its child care unit on February 18, 1952. Dr. Eugene I. Falstein is chief of the unit.

Children between the ages of 6 and 12 years will be accepted for observation, diagnosis, and evaluation and for short- or long-term therapy. They will be offered the benefit of biochemical, electroencephalographic, psychological, and psychiatric facilities for diagnosis. Specially trained personnel in the nursing, occupational therapy, and teaching specialties are available as auxiliary therapists.

Beds are available for private patients of recognized psychiatrists who will be in complete charge of their patients. They will have the use of play therapy rooms and the full cooperation of the resident and full-time auxiliary staff of the unit. Psychosomatic patients must be under the joint care of a pediatrician and a child psychiatrist. The rate for private patients is \$18 per day.

PLACEBOS.—The British Medical Journal, January 19, 1952, editorializes on use and abuse of placebos:

Dr. R. J. F. H. Pinsent (B. M. J., Vol. 2:1335, 1951) classified his treatments in one year's practice: specific or symptomatic treatment, approximately 50% of cases; health education and explanation without drugs, 40%; placebos, 10%.

General discussion at the meeting of the Royal Society of Medicine when this paper was read seemed, however, to indicate "that over general practice as a whole health education is given to about 10% of patients and a bottle of medicine as a placebo about

40%—that is, the reverse of Dr. Pinsent's practice."

In England 188 million prescriptions were dispensed in 1949. On basis that 40% were for placebos it is estimated that placebos cost Britain about 5½ million pounds that year.

Injudicious use of placebos may aggravate or perpetuate symptoms which should be treated psychologically, in other cases may tend to aggravate public lack of confidence in drug treatment that is already not uncommon. Obviously the placebo is a variety or adjunct of psychotherapy to be used with great caution.

NEED FOR PSYCHIATRIC NURSES.—Because of the serious shortage of experienced nurses in the mental hospitals, and welfare organizations, Miss Adele Poston of the Psychiatric Nurses Bureau, 145 E. 35th St., New York City, has appealed to all registered and practical nurses who have had training in this field and can work either full or part time to register at the Bureau.

Since its establishment by Miss Poston in 1925, nurses from the Psychiatric Nurses Bureau have cared for more than 20,000 patients suffering from all types of nervous and mental disorders.

AMERICAN NEUROLOGICAL ASSOCIATION.—The seventy-seventh annual meeting of this Association will be held at the Hotel Claridge, Atlantic City, N. J., from May 8 to 10, 1952.

SOCIETY OF BIOLOGICAL PSYCHIATRY.—The seventh annual convention of this Society will take place on Sunday, May 11, 1952, at the Claridge Hotel, Atlantic City, N. J. An afternoon session will be held in the Board Room at one o'clock and the evening session in Trimble Hall at eight o'clock.

AMERICAN PSYCHOANALYTIC ASSOCIATION.—This Association is holding its annual meeting May 8-11, 1952, at the Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Thursday, May 8, will be devoted to an all-day meeting of the Executive Council, and the Board on Professional Standards will

meet Thursday evening and Friday morning. The annual business meeting will take place at 10:30 a. m. on Sunday, May 11. Scientific sessions will be held on Friday afternoon, all day Saturday and on Sunday. A reception and cocktail party are scheduled for 5:00 to 7:00 p. m. on Friday, and the regular dinner dance is arranged for Saturday evening.

SOUTHERN PSYCHIATRIC ASSOCIATION.—Dr. Newdigate M. Owensby, secretary of the Southern Psychiatric Association, announces that the next meeting of the Association will be held November 2-5, 1952, at the Greenbriar, White Sulphur, West Virginia. Fellows of the Association who wish to offer papers for the program are requested to communicate their intentions to the secretary at the earliest possible date.

CORRECTION.—Harold P. Halpert, chief of the publications and reports section of

the National Institute of Mental Health, offers a correction to the news item in the March issue regarding national grants: "I must regretfully report that the sums attributed in the JOURNAL to training grants and research grants should have been stated as \$4,000,000 and \$1,663,000 respectively. The \$3,100,000 for the year 1952 was the total allotted to the various States and Territories for development and expansion of State and community mental health services. Such funds are widely used for clinical, consultative, or educational programs, with a minor portion apportioned by the States for training and research. I believe our headline in the NIMH Progress Report which featured the State allotments story was misleading."

MISPRINT.—In the article by Lindemann and Clark in the February issue, line 13 of page 561, the words, "national imitation" should read "rational imitation." We regret this error.

Having lived long, I have experienced many instances of being obliged by better information or fuller consideration, to change opinions even on important subjects, which I once thought right, but found to be otherwise. It is therefore that the older I grow, the more apt I am to doubt my own judgment, and to pay more respect to the judgment of others. Most men indeed as well as most sects in Religion, think themselves in possession of all truth, and that wherever others differ from them it is so for error. Steele, a Protestant, in a Dedication tells the Pope, that the only difference between our Churches in their opinions of the certainty of their doctrines is, that the Church of Rome is infallible and the Church of England is never in the wrong.

—BENJAMIN FRANKLIN

BOOK REVIEWS

THE COLLECTED PAPERS OF ADOLF MEYER. Volume III: MEDICAL TEACHING. Edited by Eunice E. Winters. (Baltimore: The Johns Hopkins Press, 1951.)

The previously published volumes of Dr. Meyer's *Papers*, Volume I, on *Neurology*, and Volume II, on *Psychiatry*, have been reviewed in the *JOURNAL* for November 1951 and March 1952. The present volume upholds the high standard set by the general editor with excellent indexes and accurate references. The proofreading, with freedom from typographical errors, calls for special comment. Press work, paper, type, and binding, all reflect the exacting specification used by The Johns Hopkins Press.

As pointed out by Franklin G. Ebaugh in his *Introduction*, Meyer exerted a profound effect on the teaching of psychiatry both in America and abroad. The present-day methods of instruction in psychobiology, psychopathology, and particularly the study and treatment of the patient are largely built on concepts fully elaborated by Meyer. Personality study, special examination procedures, and the "life chart" are tools used daily by most psychiatrists, inspired by the vital teaching of Meyer and exemplified in his ward rounds. The papers here reprinted cover such subjects as the principles of teaching, the value of psychology in psychiatry, undergraduate and postgraduate instruction, the meaning and scope of psychiatry, the philosophy of the subject and, most important, the "Rise to the Person and the Concept of Wholes or Integrates," a provocative paper written for the centennial number of the *JOURNAL*.

Finally, the volume closes with a few biographies of outstanding figures, written at the time of the passing of Hoch, Kraepelin, Von Monakow, Forel, Jelliffe, Marie, and others. These are particularly gratifying; fresh, succinct, intimate, judicious, they could only have been written by one closely connected with the individual and sympathetically affected by his personality. These "life charts" will give a warm glow of pleasure to many and serve to hold in memory those psychiatrists and neurologists who made, in addition to Meyer, important contributions to neuropsychiatry in the last 50 years. Also included is the "Revaluation of Benjamin Rush," in Meyer's careful, historical style. In Rush, Meyer found in part a sympathetic mind.

HENRY R. VIETS, M. D.,
Member, Board of Consultation,
Massachusetts General Hospital.

THE INTEGRATION OF PSYCHIATRY AND MEDICINE.
By William B. Terhune, M.D. (New York:
Grune & Stratton, 1951. Price: \$2.75.)

Dr. Samuel W. Hamilton was to have written this review. Since receiving the book he had carried

it around, reading passages from it with the gusto and robust enthusiasm that those who knew him will remember. Still with the book in his pocket and still engrossed in his many tasks, Dr. Hamilton passed away before he could write his comments.

It has been the privilege of the present reviewer, an internist, to carry on with him, over the past 6 months, almost daily discussions of the functions of the internist in psychiatry. Hence, to this reporter has fallen the opportunity of reporting Dr. Hamilton's impressions. While a 38-year deficit of rich experience must be acknowledged, it is hoped that this close and recent contact will help to preserve for the reader some small amount of Dr. Hamilton's vast experience, joviality, and wisdom.

"Much of human suffering lies in the unexplored region between the front line of the psychiatrist and the front line of medicine. Physicians and psychiatrists must join forces to chart this 'no-man's land.'"

The internist is becoming very much aware of a new-old word, "stress." Cannon and Selye have sketched out its physiology and pathology for him. Powerful new weapons in cortisone and ACTH, vagotomy and sympathectomy now help him to minimize the damage of patients' inner tensions. However, where possible, it would be more fit if he dealt directly with the tension itself and got to the core of the suffering. He is willing to try, but the field is a large one in which outlines are not clear and he is often bewildered as to what is required of him and how to go about it. Dr. Terhune's book, fortunately, comes to his aid in a most understanding and understandable manner.

The book is brief and straightforward—written for the trained and busy man with no time wasted on nonessentials. It begins by citing the physician's everyday need of psychiatric knowledge for child guidance, marriage problems, management of alcoholics, etc. The importance in prognosis of an early diagnosis is mentioned with a useful accompanying chart.

Psychodynamics, a fearfully complicated subject and the nemesis of many an inquisitive physician, he presents in 20 pages that will repay many rereadings.

The longitudinal life history is recommended as the practitioner's most usable technique of interview. However, for those who fear that this, in untrained hands, might become pedestrian he adds that exploratory conversations directed toward areas of usual conflict may help. For sizing up the patient, 3 factors are discussed: what he started with, or make-up; what he has had to contend with, or environment; and the precipitating factor.

However, many physicians feel adept at evaluating personalities and have no difficulty promoting ventilation, but wonder what to do with the in-

formation once it is presented to them. Dr. Terhune furnishes a formula: Reassurance and suggestion are extremely valuable and are no strangers to the practitioner. Release of tension is achieved by several familiar techniques. Emotional mobilization is performed by the more adept physicians and all doctors use persuasion daily. Yet the combination of these techniques gives the internist quite a tool chest. Planned psychotherapy will come hard to most physicians. Their offices are not arranged for one-hour interviews, their staffs are thwarted in their tasks, and practitioners feel that most patients are not ready, in this day of high overhead, to pay adequately for time spent in pure conversation with one who is not a psychiatrist.

Discussion of the physiologic aspects of psychiatry, hormones, psychosurgery, convulsive therapy, etc., introduces psychosomatic medical types and the psychosomatic history (a regular history taken by one alert to psychiatric angles). Mental hygiene, preventive psychiatry, and the example of the physician's own life and stability also receive careful attention.

In general it may be said that Dr. Terhune has removed some of the strangeness of psychiatry. Psychiatry, which sprang from the physician's relation to suffering people, now has matured enough to hand back some sharpened and refined tools that the practitioner can learn to use just as he has mastered his electrocardiograph.

ROBERT P. SMITH, M.D.,
Burlington, Vt.

KLINISCHE PSYCHOPATHOLOGIE. By Kurt Schneider. (Stuttgart: Georg Thieme Verlag, 1950. Price: \$2.70.)

The evolution of Professor Schneider's systematic approach to psychiatry, over many years of reflection and experience, is implicit in this book, which is actually a revised and enlarged edition of his *Beiträge zur Psychiatrie* (1946, 1948) and incorporates much of the material presented in the latter work, which, in turn, included 2 contributions originally published as separates in 1935 and 1939. The insertion of 2 new chapters devoted to topics previously uncovered serves to make the present volume sufficiently comprehensive to justify the new title.

The first chapter, "Clinical Systematics and Concept of Pathology," contains the essence of the author's orientation, an etiological one, viewing clinical phenomena either as psychic accompaniments of somatic illness or lesion, or as abnormal varieties of the psychic endowments or patterns characteristic of the rank and file of humanity. Included in the former category, in addition to the established organic pictures, are schizophrenic and manic-depressive psychoses; in the latter, neuroses (a designation distasteful to the author) and psychopathic (i.e., abnormal) personalities. These categories are qualitatively distinct. One implies illness or disease in the medical sense; the other does not. In both, however, *anlage* is of importance; in both, life experience modulates the clinical expres-

sion. Thus, neurosis grows for the most part on the *anlage* of abnormal personality, and thus, psychosis, though somatically determined, works with the material of the personality.

In line with these constructs, the author presents his thinking, his clinical observations, and certain guides to symptom analysis in the following clinical groups: psychopathic (abnormal) personalities; abnormal reactions to emotional impressions (neuroses, etc.); feeble-mindedness with psychosis; organic and infectious psychoses; and the endogenous psychoses, schizophrenia and manic-depressive psychosis. He makes much of the distinction between pathogenic and pathoplastic factors, and presents certain major symptom-configurations useful in diagnostic work.

In the quest of a science of psychodynamics, the march of psychiatry in much of the world has been progressively away from descriptive psychiatry. Professor Schneider believes, however, that descriptive conceptual psychiatry is an indispensable aid to constructing a scientific nosology and arriving at clearcut diagnosis and purposeful treatment. He is an effective spokesman for this point of view. This book can be recommended to the German-reading psychiatrist as an excursion into current German preoccupations in the field of psychopathology and in the multidimensional structural analysis of symptoms.

MARY B. JACKSON, M.A.,
Institute of Living,
Hartford, Conn.

CEREBRAL CIRCULATION IN HEALTH AND DISEASE. By Carl F. Schmidt, M.D. (Springfield, Ill.: Charles C. Thomas, 1950. Price: \$2.00. Also Toronto, Ont.: Ryerson Press, 1950. Price: \$2.75.)

This small volume presents in concise form the latest information on the clinical physiology of the cerebral circulation. Prior to the intensive investigations instigated by the demands for factual knowledge on this important subject during World War II, there existed a fund of evidence of cerebral blood flow and cerebral vascular behaviour that was indirect in its approach, incomplete and inconclusive in its results. Much of the confusion had been due to species differences as well as to differences among different parts of the brain of the same animal to a degree hitherto unsuspected.

It has been found that the behaviour of the cerebral circulation in health and disease can be learned only from observations made on man himself. Fortunately, Kety devised a quantitative method for the measurement of cerebral blood flow using the inhalation of a mixture of N_2O 15%, O_2 21%, and N_2 64%. The uptake of N_2O by the brain substance is calculated from a curve obtained by measurement of arterial and venous (jugular bulb) N_2O contents at intervals over a 10-minute period of inhalation of this gaseous mixture. The curve obtained by plotting these values against time must be smooth to validate the test.

The values for the N_2O contents in arterial and

cerebral venous blood during this period obviously vary with respect to time. Therefore a modification of the Fick formula becomes necessary, using as denominator the integral of the A-V nitrous oxide difference. The amounts of N_2O taken up by the brain and the A-V differences are all expressed as percentages, so that the calculation comes out in terms of blood flow per 100 gms. of brain tissue per minute. This method was calibrated in vivo against direct measurements of cerebral blood flow in monkeys and satisfactory agreement found.

Thus values for cerebral blood flow, cerebral oxygen consumption, and cerebral vascular resistance may be estimated with considerable accuracy. Such values in normal young men at physical and mental rest afford a base-line for comparison with the same functions under other circumstances and with the corresponding functions in other body organs. Kety and Schmidt have studied the effects of (1) hyperventilation, both active and passive, (2) breathing 5-7% CO_2 concentration in the inspired air, (3) high (85-100%) O_2 , (4) low (10%) O_2 , (5) after drugs and anaesthetics, (6) with schizophrenics before and after convulsive therapy and insulin shock therapy, (7) epileptics before and after attacks, (8) cases of brain tumor, cerebral haemangioma, frontal lobotomy, hypertensive vascular disease, cerebral arteriosclerosis, senile dementia, diabetic acidosis, blood dyscrasias, polycythaemia, and anaemia.

Brief mention is made of the Gibbs method for measuring cerebral blood flow in man. It is an adaption of the dye dilution (Stewart) principle and its advantages and limitations are outlined.

C. R. BURTON, M.D.,
Toronto, Ont.

LA PSYCHO-CHIRURGIE DES NÉVROSES ET DES PSYCHOSES. By *Léonard Singer*. (Strasbourg: Imprimerie des Dernières Nouvelles de Strasbourg, 1951.)

Fifty cases of lobotomy and topectomy are reported in this small volume, each in sufficient detail to indicate the nature of the condition and the result after at least 6 months following operation. There were 2 operative deaths and 24 "excellent" results. The series is relatively small, but there are 2 points worthy of mention. First is the superiority of lobotomy over topectomy, 61% excellent results as against 22.5%. The second is the desirability of insulin shock therapy after psychosurgery in the schizophrenic group. Nine excellent results occurred when insulin was used in addition, whereas only 2 cases responded in excellent fashion when insulin was not used. All these patients had had either insulin or electric shock (sismotherapy) before operation without lasting success.

The author points out that emotional tension, with anxiety, agitation, and bodily complaints, is easily influenced, whereas delusions and hallucinations are quite resistant to surgical intervention on the frontal lobes. The rehabilitation program is stressed in theory, although there is not much tangible material in regard to it. An occasional

case of epilepsy may be relieved not only of the dangerous behavior, but also of the convulsive attacks.

The author has gathered together in this volume a satisfactory number of clinical observations, and he reveals his acquaintance with the literature on psychosurgery by listing 243 references.

WALTER FREEMAN, M.D.,
2014 R Street, N.W.,
Washington 9, D. C.

THE ANATOMY OF THE NERVOUS SYSTEM. (Second Edition.) By *Olof Larsell, Ph. D., Sc. D.* (New York: Appleton-Century-Crofts, Inc., 1951.)

The anatomy of the nervous system is extremely interesting but the student invariably finds it difficult. The difficulty arises because the central nervous system has a very complicated structure and because the significance of any portion of it cannot be appreciated fully apart from the whole. To minimize the problem Dr. Larsell has carefully revised and rearranged the subject matter in this second edition so as to make available a preliminary survey of the gross anatomy, embryology, and histology of the nervous system before proceeding to the detailed description of its parts.

The book has a pleasing format and is very readable. Numerous paragraphs, with the subject of each in most cases set in blackface type, make the subject matter available in easily assimilated small portions. This is a great convenience in locating desired information and in review. Another feature of the text is the extensive treatment of function in association with structure. In this regard pertinent physiological as well as anatomical material has been carefully gleaned from the recent literature, and the author has made the sources of this material available in lists of references conveniently located at the end of each chapter.

Subjects such as the cerebral cortex, thalamus, hypothalamus, cerebellum, and extrapyramidal systems are given attention in keeping with the considerable study they have received in recent researches, and throughout the text the author has drawn on his extensive knowledge of comparative neuro-anatomy to clarify and add interest.

C. G. SMITH, M.D.,
Department of Anatomy,
University of Toronto.

MARRIAGE IS WHAT YOU MAKE IT. By *Paul Popenoe, M.D.* (New York: The Macmillan Company, 1950. Price: \$3.00.)

There are two schools of thought among practicing psychiatrists about the value of recommending books to patients. There are those on the one hand who regard it as little better than poison or the advice to "take a trip and forget it"; on the other hand, there are many who utilize this technique with an apparently high degree of immunity, have long lists of books to recommend on

any subject from alcoholism to zoophobia, and do so freely to parent-teacher's groups, rotary clubs, and individual patients. If one must give a book to a patient seeking help, one must observe certain rules, the most important of which is the simple admonition that "this will not solve your problem." If this rule is observed, there is certainly nothing in Dr. Popenoe's book that will make a patient worse or do him any harm, which is more than can be said for the average book of this type. The average patient who seeks the advice or help of a psychiatrist on a marital problem has, unfortunately, gone far beyond the help of such a book as Dr. Popenoe's. Since, as he points out, not many of our average citizens have either an opportunity or the financial ability to consult a psychiatrist in the first place, many of these problems will inevitably turn up in the offices of the general practitioner, the family doctor, the counseling psychologist, Mr. Anthony, or worse, any transient soothsayer or crystal gazer. This situation is beautifully exposed in "Where Do People Take Their Troubles?" by Lee R. Steiner.

Therefore, if Dr. Popenoe's book is to be brought to the attention of the medical profession at all, it might be worth more to the internist or the obstetrician than the psychiatrist. It is interesting and refreshing, although rather repetitive to anyone who has spent even a very few years listening to the problems brought in by neurotic husbands and wives, whatever their initial problem might be. Dr. Popenoe draws heavily on his experience with husbands and wives seeking help and has a nice, informal, anecdotal style that makes for easy reading. Perhaps the greatest value to the client reader will eventually lie in the fact that he can easily recognize himself on every page and in the therapeutic value of the realization of the universality of human problems, both neurotic and nonneurotic.

Today in our culture, it is a sad commentary on human affairs to note the high divorce rate, the ease with which marriages are both accomplished and then broken, the tremendous difficulties facing children from broken homes and the half-hearted measures that are being taken to remedy the situation. Perhaps, then, it is unfair to pass too critical judgment on the efforts of a man who has made so many attempts to mend the warped cultural pattern. This is the eighth book he has written in this or related fields, and as Director of the Institute of Family Relations in Los Angeles he has had a wide experience of successful endeavor in helping marriages to work. In the long run, it is the marriage counsellor, the local physician or family doctor who can do so much to head off impending disaster in potentially successful marriages and, for them, Dr. Popenoe's book will be a useful addition.

HARRIOT HUNTER, M.D.,
Division of Psychosomatic Medicine,
University of Colorado Medical Center.

GENERAL PSYCHOTHERAPY: DYNAMICS AND PROCEDURES. By D. Ewen Cameron. (New York: Grune & Stratton, 1950. Price: \$5.00.)

Dr. Cameron has produced a very readable text covering briefly (in 300 pages) a considerable range of related topics, such as individual psychotherapy in outpatient and inpatient settings, various aspects of somatic therapy, projective methods, group psychotherapy, the role of the nurse in psychotherapy, and the manipulation of social factors. He provides a systematic construct reinforced by many details of theory and method. The author closely relates his observations to the theories and facts of the experimental social sciences, providing numerous citations from the literature of psychology, sociology, and anthropology. This emphasis is due, and Dr. Cameron is well equipped to provide it. Nevertheless, the reader will be especially impressed by the gaps between clinical psychiatry and the related experimental disciplines. In an effort to systematize these relationships as a basis for psychotherapy, considerable space is given in the opening chapters to a formulation of the working premises and basic concepts. The content of the remaining chapters is frequently coupled to this formulation.

A chapter on the *modus operandi* of psychotherapy is subdivided in terms of the basic concepts listed by the author. Under the first of these, "normalization," which is more or less the psychological equivalent of Cannon's homeostasis, it is noted that psychotherapy functions by desensitization, rationalization, suppression and repression, reassurance seeking, dependency, and various guilt-producing mechanisms (punishment, repentance, etc.). Ways in which psychotherapy operates under the second basic concept—that the organism "needs to relate itself to others in order to attain full expression"—include "completion" by fuller expression of one's inhibited feelings, "identification," "projection," and "group dynamics." Psychotherapy also operates under the third basic concept, that of "adaptability," by "reconceptualization," especially of situations that are currently threatening and those that continue out of the past as a problem. This classification seems largely the product of Dr. Cameron, though it is not submitted as an original contribution. In its directness and simplicity it recalls the efforts in categorization by psychologists of fairly recent decades. Perhaps this is what is needed—even though most current academic psychologists have dispensed with such attempts. The difficulty is in reciting sufficient objective data to establish adequate verification of such an inviting arrangement.

A concise chapter is provided on the indications for psychotherapy in general and in terms of specific types of emotional disturbance. Emphasis is placed on defining the goals of treatment in each case, and limiting factors are presented. The better established principles are described in a simple but convincing way. Consideration then is given to the training and choice of therapist. Preferred medical school and psychiatric residency programs

are described. A personal training analysis is considered unnecessary or even harmful, seminars in anthropology and sociology being recommended to give the therapist deeper understanding and relative freedom from emotional bias.

The author then proceeds to a discussion of therapy by intensive psychological analysis (referred to as "integrative psychotherapy"). The areas to be covered with the patient in the initial interviews are explained, including his preliminary orientation and his role in the treatment process, the introductory anamnesis, the physical examination, the general pattern of response to treatment, and the part played by the therapist—which is largely a passive one. The techniques of nondirective exploration and the dynamics of communication are also considered. Therapists are advised in the uses of summarization and running conceptualizations. Techniques are presented for acquainting the patient with his unconscious emotions and working through some of his resistances. At times the therapist must assume a more directive role and the indications are covered in some detail (8 pages). The attitudes of both physician and patient in the treatment situation are given attention. An additional chapter is provided to cover various difficulties and resistances encountered in the course of treatment. A few specific syndromes are given brief mention. Throughout the chapters dealing with integrative psychotherapy there are numerous descriptions of specific therapeutic methods. While most of these will be familiar to the experienced psychiatrist-reader, many of them will bear repetition and a few will likely add to his knowledge.

More directive psychotherapy comprises the next largest portion of the book. Procedures of this type are advised when treatment goals are restricted by inadequate intellectual capacity or undue rigidity of personality, when the patient accepts authoritarianism, and as a complementary approach in certain phases of integrative psychotherapy. Specific applications are ventured, as the treatment of alcoholism by conditioning, and the treatment of stammering and homosexuality by retraining. A full chapter is devoted to hypnosis. The relative detail given this topic makes it one of the stronger portions of the book.

Discussion of somatic therapy, art therapy, use of recorded interviews, group therapy, nursing, and social factors is, perforce, short on detail but rounds out the picture in such a way that the reader is left with a clear general impression of the whole.

In all these pages there is a direct quality that leaves little room for misunderstanding, and yet freedom of choice in method and application is not unduly restricted. The book should prove of interest to undergraduate and graduate students in psychiatry and also to physicians at other levels of experience in psychotherapy, as well as to advanced workers in the related disciplines.

NATHANIEL WARNER, M.D.,

Payne Whitney Psychiatric Clinic,
New York City.

A PRIMER FOR PSYCHOTHERAPISTS By Kenneth Mark Colby, M.D. (New York: The Ronald Press Company, 1951. Price: \$3.00.)

In the preface, the author states, "Like all primers, this is a small book of elementary principles written for beginners. The beginners in psychotherapy addressed here are all those with a professional intent in pursuing the subject—internes or residents in psychiatric hospitals and clinics, practicing psychiatrists, clinical psychologists, and psychiatric social workers." It is my feeling that, while this professional book will prove of real value to beginners, it will also be of real value to more experienced psychotherapists. One assumption that the author makes is, "We assume that, before the therapist attempts any psychotherapy, he will have acquired a familiar acquaintance both with the main clinical facts about neurotic and psychotic behavior and with convenient working concepts of a dynamic-genetic—structural—economic nature to use in understanding this behavior. These data are admirably, if tortuously, collected in Otto Fenichel's 'Psychoanalytic Theory of Neurosis,' a book which must be read very slowly, in small doses, patiently and repeatedly." By implication, Colby feels that Fenichel's book is one for beginners.

This is the only criticism that I can make of the entire book. In my opinion, Fenichel's book is hardly a book with which a beginner would be familiar as it is difficult to understand, as the author points out. Unfortunately, I know of no other book that is easy to understand that contains so many essential facts on basic theory. The primer contains some excellent chapters on the patient, the therapist, time and space condition for the interview, and behavior of both the patient and the therapist during the interview.

In the chapter on "The Patient," there are many excellent suggestions as "who is chosen" for treatment, "the most suitable type," and "the least suitable type." Such elementary and yet essential information as "how long to see the patient, how often and how to handle the breaking of appointments" are covered in the chapter on "Time and Space Conditions for the Interview." While much of this information may be well known to the advanced psychotherapist, he will undoubtedly find some worth-while suggestions that he can use to improve his efficiency as a therapist.

The main portion of the book contains 3 chapters on the beginning, the middle course, and the ending of therapy. Much basic information is given, illustrated by quotations of many examples from the records of the author's practice. Such basic information as how to accept or decline a patient for treatment, "the psychotherapeutic atmosphere," the handling of personal questions asked by a patient, "drugs, and relatives," "political or religious beliefs" are covered in the chapter on "Beginning the Therapy." At the end of this chapter, the author gives a summary of the first 4 interviews with a patient to illustrate how these principles are put into practice. I was hopefully expecting that he would con-

tinue this same case in the next 2 chapters, but other equally illustrative cases were reported instead.

The chapter on "The Middle Course of Therapy" contains such necessary discussions as "interpretations," "handling of resistances," "transference," and, at the end, has another illustration of typical uses of these techniques. Perhaps I should restate that throughout the book the various principles are illustrated by many examples from the records of the author's own practice.

Especially valuable to the beginner will be the sections on "interpretations," "resistances," and "transference."

Except for the last chapter, the book is directed to the treatment of the neurotic. Since a part of the work of any psychotherapist involves the treatment of schizophrenic patients as well as neurotics, a section of the psychotherapy of "ambulatory or latent" schizophrenics has been added. I regard this chapter as one of the finest that I have ever read on this subject. Again, in this chapter, illustrated case histories are used.

Since this book was designed for the beginner, the author might have given some references for future reading but perhaps he felt that Fenichel's book contained all that one could ever ask for in that respect. In closing, I feel that this book should be required reading for all beginners and will also be of real value to those who are experienced psychotherapists as well.

JOHN W. SCHUMACHER M.D.,
Minnesota Psychiatric Institute,
Minneapolis.

PSYCHOTHERAPEUTISCHE STUDIEN. By *Ernst Kretschmer*. (Stuttgart: Georg Thieme Verlag, 1949.)

"Studies in Psychotherapy" is a collection of Professor Kretschmer's researches and clinical experiences in mental illness. Its main goal is to bring together the findings of constitutional biology, neurophysiology, and depth psychology as a basis for psychotherapy. Prominence is given to the role of the vegetative nervous system in personality. A research study is reported that shows the difference in the handwriting pressure, galvanic skin response, and blood pressure curve after sympathin injection, of individuals in each of Kretschmer's 3 body types. Kretschmer concludes from this and other research that tonus regulatory mechanisms of voluntary musculature, vegetative nervous system, and affectivity stand in intimate relation to each other and to the body type of the individual.

Kretschmer's emphasis is on the morphological-physiological-psychological unity of the individual, in which cause and effect are not distinguishable, but form, so to speak, a closed circle. His main effort is to determine how the therapist can enter into the psychic side of this circular process, and what the goal of therapy is.

Kretschmer's psychotherapeutic methodology is based mainly on 3 approaches, modified hypnosis,

exercises in tonus control (similar to Jacobson's progressive relaxation), and direct guidance. His operating principles are to clarify the actual conflict situation and to "anchor" the insights gained, in the depth personality of the individual.

With respect to schizophrenia Kretschmer makes the point that recognition of autogenous factors is by no means to be equated with a judgment of the inevitability of the course of the disease. To the contrary, he emphasizes the worthwhileness of psychotherapy with schizophrenic patients and points out the importance of the warm-hearted humanity and personal manner of the therapist.

This book opens many avenues of thought on the subject of psychotherapy. It is not easy to read, however, and there are many nuances which this reviewer has missed. "Studies in Psychotherapy" is not a summing up of pertinent literature in the field of psychotherapy. Indeed little mention is made of work done outside Germany in autonomic physiology, in the psychotherapy of schizophrenia, or in body typing. It may be that the literature in these fields was not available to the author.

There is no subject index, and no alphabetical authors' index. Authors are mentioned in the text whose names do not appear in the bibliography.

J. SANBORNE BOCKOVEN, M.D.,
Boston Psychopathic Hospital.

LEITFADEN DER NEUROLOGIE UND PSYCHIATRIE. By *Wolfram Kurth*. (Stuttgart: Georg Thieme Verlag, 1949.)

This short textbook of less than 300 pages contains an amazing wealth of material. The book is written in a manner approaching "telegram-style" and no words are wasted. The book is not written for the medical student who needs introduction into the fields of neurology and psychiatry, at it is too comprehensive; nor is it written for the specialist in neuropsychiatry, as it restricts itself to the generally accepted facts and avoids controversial issues; but it addresses itself to the majority of practicing physicians, general practitioners, obstetricians, ophthalmologists, etc., who may be confronted with a neurological or psychiatric problem. Thirty-six heuristic tables that lead the reader from the prevalent symptom to the underlying disease are well arranged and should prove of great value. While the condensed style of the book will restrict its use to the orbit of the German language, this reviewer is, on the other hand, so impressed by its usefulness that he recommends a translation of all the tables of the text and heuristic tables into English.

RUDOLPH NEUSTADT, M.D.,
VA Hospital,
Bedford, Mass.

PROGNOSE UND THERAPIE DER GEISTESKRANKHEITEN. By *Max von Müller*, M.D. (Stuttgart: Georg Thieme Verlag, 1949.)

This second edition of Professor Müller's excellent monograph on prognosis and therapy in the

major psychoses appears some 15 years after the original was issued. It was warranted, according to the author, by the advent of the new therapeutic instrumentalities, the constitutional and somatic as distinct from the psychological, represented notably in insulin and other forms of shock therapy and in "psychosurgery." The work is completely revised, yet it retains and reaffirms the viewpoint originally advanced by the author: the primacy of the psychological in the etiological constellation of the psychiatric disorders. The author is no less emphatic in stressing the need to conceptualize and to deal with the totality of the patient—*die Ganzheitserfassung des kranken Menschen*. The catholicity of the author's position with respect to the varying modalities of treatment is one of the most gratifying qualities of this entirely splendid work. It stands in bright contrast to the provincial factionalism that in so many ways confounds the thinking in, and impedes the advance of, psychiatry.

Professor Müller's monograph, as already noted, deals primarily with the major psychoses: with schizophrenia, manic-depressive psychosis, and with the luetic, the epileptic, and the toxic involvements of "brain and personality." Each division begins with a consideration of prognosis and prophylaxis. Then follow the sections dealing with constitutional therapy and psychotherapy. The monograph is written primarily from the viewpoint of the institutional psychiatrist, yet it has much to offer to the "extramural practitioner." Indeed the first half of the work, dealing with the general principles and data of prognoses, prophylaxis, and therapy, in itself constitutes a distinguished and valuable contribution to the basic psychiatric texts. It offers a humanistic and informed survey of the social, individual, and therapeutic dynamics of the psychiatric disorders. Particularly noteworthy is the section dealing with institutional treatment. Professor Müller terms this "collective therapy," and basing his arguments on the thesis and programme advanced by H. Simon (*Aktivere Behandlung in der Irrenanstalt*—Berlin und Leipzig, 1929) further elaborates the philosophy and the dynamics of effective therapy within the mental hospital.

IAGO GALDSTON, M. D.,
New York City.

MASKS AS AGENTS OF SOCIAL CONTROL IN NORTH-EAST LIBERIA. By *George W. Harley*. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. 32, No. 2. (Cambridge: Peabody Museum, 1950. Price: \$3.25.)

In the past decade with the suppression of the great secret society named Poro among the Mano and Gio peoples of northern Liberia, Harley was able to collect large numbers of sacred carved masks and the information regarding their identification and use within the cult. Government was by chiefs whose authority was reinforced by a council of elders. Any matter that threatened to lead to further resentment and action by the loser or his

surviving relatives would be referred to higher authority, i.e., the spirit world, through the medium of the mask and drinking the poison cup of sasswood (*Erythrophloeum guineense*). The mask was, it is true, worn by a living man, but when wearing the mask he was the embodiment of the spirit and therefore anonymous and blameless for his actions. The most important masks were those representing dead priests or famous men, and they were believed to still harbor the spirit of the individual. All men of the tribe belonged to the secret society, which had a hierarchical order of membership, and all masks and society activities were tabooed to women.

The work is illustrated with excellent collotype plates of masks and ceremonial paraphernalia.

ROBERT F. HEIZER, Ph. D.,
University of California.

THE YEARBOOK OF PSYCHOANALYSIS. Vol. VI. Edited by *Sandor Lorand, M.D., et al.* (New York: International Universities Press, Inc. 1950.)

The first 4 papers of this volume deal with the origin and development of psychoanalysis. "The Spirit of Psychoanalysis" by Fritz Wittels is a brief but lucid account of the development and trends in psychoanalysis. Wittels points out that psychoanalysis is no longer exclusively scientific (research), but curative, health promising, or as he would call it: Messianic. Freud, employing a method of direct observation of life, was able to rise above the mechanistic and dialectic methods of his time. He was the first to see clearly the connection between psychic conflict and somatic disturbances. The causal therapist is interested in psychic conflict and not the noise made by the somatic disturbance. The psychosomaticists instead of analyzing psychic conflict have listened to the noise of somatic compliance. Psychosomatic medicine all too often means psychoanalysis without psychoanalysis. The psychosomaticists talk of repressed aggression, frustrated ambition, swallowing too much in life and other conditions so frequent that they are always right, particularly if they enumerate a combination of them. Psychosomatic medicine is one more way to satisfy resistance against indigestible psychoanalysis.

Paul Bergman in "The Germinal Cell of Freud's Psychoanalytic Psychology and Therapy" presents a thesis that a student may assimilate the work of a genius by attempting to find out whether there was an original experience that sent the creative mind out on its way, illuminating, as it were, the world with the light gained at that one focal point. The genius of a Darwin, a Pasteur, an Einstein seems to grow from a focal point. The germinal observation in Freud's mind can be formulated thus: a person may experience intense conflict concerning a sexual impulse and eliminate the experience from the context of his memory. His memory in fact shows a gap—or a patently wrong substitute—for this point or period of time, which seems to protect the person from re-experiencing

the intense (traumatic) conflict. The organism from then on shows serious signs of malfunctioning (symptoms). These symptoms can be dissolved when the patient can be made to remember what really happened and how he felt when it happened. The excluded and walled-off part of the patient's past is thus reintegrated. The current of life is freed of a more or less strangling obstacle. Dr. Richard Sterba in an interesting but fanciful paper, "The Cosmological Aspect of Freud's Theory of Instincts," draws a relationship between instincts and the history of the universe.

Five papers are devoted to dreams. Dr. Robert Fliess presents a study based on the paper, "The Revival of the Study of the Dream," which was a contribution to the Symposium on Dreams, held at the 1949 meeting of the American Psychoanalytic Association. This paper is an exceptionally valuable learning experience for the reader. Dr. Fliess adds his valuable discussion and comments to the various papers included in his study. He presents papers concerning dream symbolism; "typical" dreams; dreaming and "acting out"; the hypnotic "dream"; the "telepathic" dream; the "prophetic" dream; insomnia and hypersomnia; and "dream behavior" in the child. Dr. Bertram D. Lewin's paper, "Inferences from the Dream Screen," is a valuable contribution to our knowledge of sleep and oral eroticism.

The remaining 11 papers cover miscellaneous subjects. There is no preface to indicate why, from all the psychoanalytic material appearing in 1949, these papers were selected to comprise the Yearbook. The reviewer would presume that the editors considered them to be the best in psychoanalytic reading for that year. The value of the book could be increased if the editors discussed the basis for their selection, and added their comments to the papers presented. This would also add to the interest of the reader and the Yearbook then would serve the purpose of tracing the more important current trends in psychoanalysis.

MORRIS W. BRODY, M. D.,
Philadelphia, Pa.

A STUDY OF EPILEPSY IN ITS CLINICAL AND GENETIC ASPECTS. By Carl Henry Alström, M.D. (Copenhagen: Ejnar Munksgaard, 1950. Price: 20 Swedish crowns.)

Carl Alström, head of the Laboratory of Human Genetics at the Caroline Institute, has carefully studied 897 families in which one or more members suffer epilepsy. He views epilepsy as a symptom disorder, not as a disease *sui generis*, and finds that the "lesion" producing the symptom is only rarely gene-determined. The material is remarkable for its size, stability, and relative freedom from bias. The methods are notable for sound diagnostic criteria, detailed data analysis, and thoroughness in personal investigation.

Some of his findings and inferences are as follows: (1) Relative risk of contracting epilepsy was evenly distributed over life span. (2) Probability of recovery after disorder had lasted 5 years

was 20%; nearly 70% of mentally unaffected and socially adequate patients suffered from seizures for several decades. (3) Cause of epilepsy was unknown in 70% of cases. (4) Prognosis was more dependent upon basic pathology than upon medication; with respect to psychic change, recovery from seizures, and mortality, prognosis was best when cause was unknown. (5) Mentally unaffected epileptics fare as well as the general population with respect to marriage rate, school performance, social and occupational status and show no excess of criminality. (6) The average over-all incidence of epilepsy among close relatives of epileptics was 1.5% and did not significantly exceed that of the general population when analyzed. (7) In only 11 of 897 families was there a monohybrid mode of transmission. Thus the data did not support a genetic hypothesis for epilepsy as a whole nor did they lend support to eugenic legislation. The author's critique of historical and contemporary work on epilepsy is incisive and candid.

This is a scholarly work, carefully constructed and clearly written. I believe it to have enduring value.

G. WESLEY WATSON, M. D.,
Boston, Mass.

PRINCIPLES OF GENERAL PSYCHOPATHOLOGY. By Siegfried Fischer. (New York: Philosophical Library, 1950. Price: \$4.75.)

This book is described as a survey of the field of "general psychopathology," which is defined as follows, "General Psychopathology is the science of the regularities of pathological mental happenings. In contrast the task of individual psychopathology is the investigation of the mentally sick individual."

The book is divided into 4 parts. Part One gives a comprehensive and rather easily read discussion of various concepts that fit well into the pattern of accepted descriptive psychology. Some of the author's statements, however, become a little involved as, for example, in the discussion of perseveration: "We must, therefore, assume that every brain lesion results in a general laboriousness of the processes of association and thought which causes a reinforcement of the tendency of perseveration."

Some statements might be challenged. In describing variations of mood during seasons, he states, "These changes obviously depend on changes in weather and temperature." Older terminology is used rather freely as, for example, "nervous exhaustion," "symptoms of insanity."

In Part Two, the section on dynamic psychopathology, which is described under the general heading of "Comprehensible and Causal Connection," it appears that the author is making an attempt to correlate his descriptive psychology and psychopathology with psychoanalytic doctrines. Frequently criticism of psychoanalysis is expressed or comments at variance with analytic principles are made. Such statements as, "The entirely normal adult, who is emotionally free from childhood experiences, finally adjusts to all normal conditions of life in a healthy way, even though these adjustments may occasion the severest psychological suffering,"

are not acceptable to this reviewer. How one can be "emotionally free from childhood experiences" is difficult to understand.

Part Three, which is used to describe "Syndromes" (symptom-complexes), is only 7 pages in length and describes 8 "syndromes." The types delineated are exogenous syndromes, syndromes of diffuse damage to the brain, emotional syndromes, syndromes of delusion, hallucinosis, the neurasthenic syndromes, the psychogenic syndromes, and the dyskinetic syndromes. The author would have been well advised to have deleted this part of the book. In describing the neurasthenic syndromes he states as follows: "This syndrome is usually found in true neurasthenia, a disease which may be observed in conditions of exhaustion of varying origin It is very probable that the absence of, or unsatisfactory sexual intercourse is a frequent, and often the most important cause for the appearance of this syndrome. . . . The neurasthenic syndrome is persistent in so called constitutional neurasthenia."

In Part Four the author discusses "The Abnormal Personality."

Although the book is of interest and of some value, it is not recommended without considerable reservation.

RAYMOND W. WAGGONER, M.D.,
Neuropsychiatric Institute,
Ann Arbor, Mich.

ADVANCES IN UNDERSTANDING THE OFFENDER. The 1950 Yearbook of National Probation and Parole Association. Edited by *Marjorie Bell* (New York: National Probation and Parole Association, 1951. Price: Paper, \$1.50; Cloth, \$2.00.)

This volume presents the papers given at the Annual Conference of the National Probation and Parole Association and the Congress of Correction in 1950.

The essays fall into 8 groups: "Federal Justice and the Delinquent" (Attorney General McGrath), "The Juvenile Court as a Community Agency," "Institutional Treatment of the Delinquent" (one paper by S. R. Slavson), "Organization of Probation and Parole Services," "Psychological Study of Personality Deviations," "Probation and Parole Abroad," and "Legal Digest."

Melitta Schmeideberg discusses "The Criminal Psychopath." Her view is that the neurotic pattern may become converted to the psychopathic one, that the psychopath feels emotions or guilt too intensely and painfully, and that he is likely to suffer from intense depersonalization—views that are, to say the least, not unanimously accepted by psychiatrists.

Leo Orenstein discusses "The Sex Offender." He points out the unclarity of the concept of sexual psychopathy, and remarks further on the difficulty of treatment with the present limitations of money, time, and personnel. He reminds us that psychiatric examination of the complaining witness might be arranged with profit, especially for the light it would throw on the offender's behavior.

Louis D. Cohen discusses "Psychological Techniques in Probation and Parole Work."

The Association is continuing its program of many years, attempting to bring to the procedures of probation and parole the findings of modern sociology and penological and psychological science.

WINFRED OVERHOLSER, M.D.,
Saint Elizabeths Hospital,
Washington, D. C.

SOCIAL WORK YEAR BOOK 1951. Edited by *Margaret B. Hodges*. Eleventh Issue. (New York: American Association of Social Workers, 1951.)

The Social Work Year Book, now published biannually, has been a part of the standard equipment of social agencies since 1929. Although it appears this year under new auspices, the American Association of Social Workers, its form is practically unchanged except for a broader coverage of fields related to social work. This widening of coverage reflects not only the mutual dependence of health, education, and welfare, but the increasing recognition of the importance of integrating services from all related fields if the best interests of both the individual and society are to be met.

To cover this broad field of general social needs, 73 authorities have contributed articles on activities and programs organized to cover the gamut of human needs from prenatal care to recreation for the aged, as well as organization, financing, and administering various types of social agencies.

Each article is written clearly and to the point and is followed by a well-chosen bibliography.

In addition to this topical coverage of program, Part II of the book is a directory of agencies, United States and Canadian, international, national (both governmental and voluntary) with a brief outline of the purpose and activities of each organization.

This book is an essential reference volume, Part I providing interpretation, development, and trends in program, and Part II the functions of the national agencies that give general direction and leadership. The great scope of work done in the social work field is interpreted and catalogued and future trends and developments indicated.

HESTER B. CRUTCHER, M. S. S.,
Department of Mental Hygiene,
State of New York.

ADVENTURE IN MENTAL HEALTH: Psychiatric Social Work with the Armed Forces in World War II. Edited by *Henry S. Maas*. (New York: Columbia University Press, 1951. Price: \$4.50.)

"Adventure in Mental Health" is indeed well named. For it was a great adventure for the psychiatric social worker, dedicated to high standards of service for the individual, to change his focus from the needs of the few to the needs of the armed forces. It meant changing goals, and facing a very concrete measurement of the achievement of the

desired goal, namely, the return of the largest possible number of emotionally upset military personnel to active duty. When this was not possible other plans had to be worked out expeditiously, and all work had to be carried out within the framework of directives and technical bulletins set forth by the War Department. Work in the military settings was a far cry from the permissive and supportive situations that psychiatric social workers in civilian practice develop in the course of treatment.

How the psychiatric social worker adapted his skills to the pressures of the military settings is related in Part I of this book. The eight authors are military psychiatric social workers who worked in various branches of the armed forces both in this country and in the theaters of war. They worked in various hospitals and clinics and in combat units as a part of the psychiatric team responsible for maintaining or restoring the mental health of the military personnel. To work successfully required adaption of skills to meet the needs of large numbers. This meant imagination and ingenuity, and constant evaluation to extend services to those in need. Methods of mental health education had to be developed for maintaining morale and to promote mental health at all levels—which meant the fitting of one's knowledge to the needs of the group at hand.

Part II of this book gives the picture of the civilian social worker in the war effort, how the American Association of Psychiatric Social Workers swung into action, the activities of its war service office with its significant developments, and the immediate and almost phenomenal development of psychiatric social services by the American Red Cross.

The psychiatric social worker's role in the selective service medical survey program reveals a remarkable flexibility and a capacity to adapt case work services to the demands made by the war emergency as well as the value of well-integrated community services.

Thus we see that psychiatric social services when available were used from the time of induction until discharge. The fact that the War Department Technical Bulletin (Medical) No. 154: Psychiatric Social Work gave recognition to the profession indicates the value of the services rendered. But what have we learned and what is the significance of this experience?

Part III entitled, Implications for Current Civilian Practice, evaluates what was learned and points out significant trends for the future development of psychiatric social work. A forthright challenge is sounded to the psychiatric social worker to show more visible results, to do more experimentation in the field of practice, to participate more extensively in a preventive program, and to integrate community services more closely in the mental health field.

The chapter on mental health education and research suggests ways of selecting groups and methods of working with them in making a significant contribution to community projects in the mental

health area. The apparent resistance of social workers to research, in spite of its importance as an integral part of any profession's sound practice, is noted.

Because this book is made up of articles by so many different authors, it lacks a certain cohesion that would give one a unified account of what took place during these significant years, but there are advantages in presenting the individual's own account of what he did, how he did it, and what its values seemed to be. It is an important book both for psychiatric social workers and other members of the team with whom they are ordinarily associated and for those interested in future developments in the mental health field.

HESTER B. CRUTCHER, M. S. S.,
Department of Mental Hygiene,
State of New York.

AIR WAR AND EMOTIONAL STRESS. By Irving L. Janis. (New York: McGraw-Hill Book Company, 1951. Price: \$5.00.)

In this timely publication, Dr. Janis brings together in convenient form much of the more significant material he has collected previously in a series of reports that have been largely restricted in their distribution to specialists in national defense research. These reports were sponsored as part of a research program for the United States Air Force carried out by a private nonprofit organization, the Rand Corporation.

Dr. Janis has undertaken to evaluate the stresses to which American civilians may be subjected in case of attack by Russia with atomic weapons, and concomitantly to estimate the emotional reactions to these stresses that reasonably may be expected. He reviews critically the relevant reports in the literature that describe the reactions of other civilian populations to air war (in Japan, England, Germany, and Spain) and devotes one section to special consideration of the limited reports that are available as a basis for psychological appraisal of the survivors after the atomic bomb explosions over Hiroshima and Nagasaki. In the last section of the book, he discusses various approaches that might be successful in preventing or controlling disruptive behavior among American civilians if atomic weapons are used against them. Throughout this section he properly emphasizes the tentative nature of his suggestions and makes a strong plea for appropriate research that might fill in the large gaps in our actual knowledge of what to expect and what to do.

Perhaps the greatest service performed by the book is the digest of observations on civilian reactions in World War II provided in the second section of the book. Here we find much of the literature reviewed that is not easily available to the lay or average medical reader, and in spite of the obvious limitations imposed by his varied source of material Dr. Janis has succeeded in presenting a reasonably coherent picture of what it feels like to be bombed. It is perhaps unfortunate that this section is not presented first. Had this been done,

the general conclusion that atomic bombing is not too different from high explosive bombing in its psychological effects on civilians might have had more meaning to the previously uninformed reader. As the book is now arranged the reader is expected to compare the special cases of Hiroshima and Nagasaki with other World War II experiences before the latter are discussed.

In the third section Dr. Janis has presented plans that may be helpful for preventing and controlling disruptive behavior among American civilians. This section will be probably the most interesting portion of the book to those interested in the problem of civil defense, but it is unfortunately the least authoritative. Some of his suggestions may appear to medically trained readers as being somewhat naive. For example, his proposal that leukocyte counts be done on the entire population in order to provide a base line for evaluating radiation exposure seems hardly worth the great effort it would entail. The use of emergency rooms in hospitals for giving relief teams actual surgical experiences might also be open to serious question. In general, however, his proposals are quite reasonable and well worthy of serious consideration. In fact he may be overinclined at times to suggest elaborate validation by research when general clinical experiences already could be used to evaluate the methods adequately. For instance, he believes that there should be systematic investigation of whether it is helpful or not to put chronic individuals on a strict regimen to avoid their developing undue anxiety. Certainly the experience with cardiac patients has demonstrated rather conclusively that too strict a regimen gives rise to severe anxiety in many instances. In general, however, the research proposals he makes are well justified and one can hope that the threat to national security may bring about support for many of them. As a psychologist he obviously does not trust too far the clinical evaluation of emotional states, and one interesting omission in the book is no reference to proposals by Tyhurst for clinical investigation on panic problems.¹

In spite of the limitations that have been pointed out, this book can be recommended strongly to all medical and lay planners for civil defense programs.

CALVIN S. DRAYER, M. D.,
Philadelphia, Pa.

SELECTION FOR PAROLE. By Lloyd E. Ohlin. (New York: Russell Sage Foundation, 1951. Price: \$2.00.)

PROBATION AND PAROLE. By David Dressler. (New York: Columbia University Press, 1951. Price: \$3.25.)

As research sociologist, Illinois Division of Correction, Lloyd Ohlin is well equipped to write about selection for parole in that state, and particularly about prediction methods as part of such selection. He has given us an informing and thought-provoking book. Primarily concerned with

statistical prediction of parole success, Ohlin properly considers it in its relationship to other sources of information used in determining the time of release from prison. Conscious of many difficulties involved in using such actuarial methods, he is nevertheless enthusiastic about the present merits and future possibilities of the Illinois system. The reader will find in this book stimulating discussion of parole selection in its wider aspects, and of parole prediction as presently in use in Illinois. He will not find, however, critical analysis of the whole process of parole selection in that state. Such an analysis would have required evaluation of the quality of Illinois prisons and personnel, of the work of the Diagnostic Depot, of the effectiveness of Illinois parole supervision, and of other aspects of the entire penal system. Not all of that system is as original as the actuarial device, or as progressive as the classification depot.

Within the wide literature concerning parole prediction, Ohlin's book seems notable for its discussion of a recent improvement in the Illinois prediction system. Such actuarial systems have properly been criticized as static. That is, their predictions of parole success have been based upon the assumption that a large number of conditions that favor or hinder such success remain unchanged as between the time when the statistical studies of past experience were made, and the time when new parolees are being considered for release. To meet this difficulty the Illinois staff revises the basis for prediction annually, adding to it the experience of the most recent year available and deemed suitable. This is an important improvement. Nevertheless the reviewer is skeptical that this change will remove all the difficulty. Can the change be made quickly enough? As at present set up the bases used for prediction will not measure the influence of such tremendously significant changes as those from "tough" to constructive-minded wardens; from politically appointed parole agents to those selected on merit; or from communities indifferent to the return of their citizens from prison to communities organized as Clifford Shaw is organizing them to aid in their adjustment. It may be idle to hope for such favorable changes in all of our states, but should they occur they might well alter greatly the predictive validity of the 12 factors now used in Illinois, unless they chanced to be correlated with those factors.

It is also a bit difficult for the reviewer fully to share Mr. Ohlin's confidence that the use of these actuarial devices will not discourage somewhat the use and improvement of individualized bases for release from prison, which must always remain the most pertinent criteria of parolability.

Mr. Dressler's book is intended to "articulate a rationale of probation and parole" for "social workers, probation and parole officers and administrators in the correctional field." It grows out of some 17 years of thought and experience. To the reviewer

¹ Individual reactions to community disaster; The natural history of psychiatric phenomena. *Am. J. Psychiat.*, 107: 764, April 1951.

² Cf. John Bartlow Martin, "America's Toughest Prison," *Saturday Evening Post*, October 20, 1951, pp. 19ff, and succeeding articles.

the chief merit of this book lies in its partially successful effort to harmonize the probation and parole officer's duty to protect society with his concern to be helpful to his charges. The officer may also find some helpful hints for meeting specific problems in this book, although even in this respect it hardly seems to have added much to previous writings of its type.

The book is oriented from the point of view of the psychiatric social worker. It contributes nothing to the still-not-quite-achieved reconciliation between the psychiatrist and the sociologist, or between schools of social work and departments of sociology. Such reconciliation is possible and greatly needed. Readers of this JOURNAL will pardon the reviewer, as a sociologist, if he calls attention to apparent grave shortcomings in this respect in the book under review. It goes without saying that psychiatry and psychiatric social work are indispensable to good probation and parole work. But one wonders whether Mr. Dressler has ever "cracked a book in sociology." To judge from his book he never heard of Clifford Shaw's demonstrations of the importance of neighborhoods for delinquency; of Thrasher's and others' proof of the importance of the gang; of Sutherland's epoch-making studies in white-collar crime; or of evidence, vastly significant to the probation officer, that delinquents "get that way" in no small measure because of values in the general culture that we all accept. Studies of these types have important implications for the investigations the probation officer makes; for the use of natural as well as artificial groups to assist the probationer; for understanding the attitudes of probationers such as the view that everyone has a racket; or for programs designed to remove the causes of delinquencies in our communities. Nor does Mr. Dressler seem concerned over current efforts to take away from the court the treatment function and give it to a board of specialists. In spite of some usefulness, the book is disappointing.

DONALD R. TAFT,
Department of Sociology,
University of Illinois.

NUTRITION AND ALCOHOLISM. By *Roger J. Williams*, with a foreword by A. J. Carlson. (Norman, Oklahoma: University of Oklahoma Press, 1951. Price: \$2.00.)

Carlson makes a special plea that the suggested approach be carefully tried out by competent medical people, stating, "In my opinion, he has opened a new and important gate to the solution of one of the serious problems of mankind. His ideas and recommendations should by all means be given adequate tests. Even if there are failures or partial failures, medical science and medical practice will be enriched and new ways may be opened for further advance."

With the backing, therefore, of such an eminent authority as A. J. Carlson, one picks up the book with the hope that perhaps we have at last come to some new and important concepts about alcoholism and that we will be able to make important progress.

The book is very small, only 82 pages; in spite of that there is quite a bit of repetition. The author's ideas are given in very simple language, as if the book were intended for general reading rather than for those with a medical or other scientific background. The author's concept can best be given by quoting directly from the book: "It is our conclusion, based in part on findings to be reported in later chapters, that alcoholism is at least in large part a genetotropic disease, that is, one which stems from both an inborn or hereditary trait and nutritional deficiency. The hereditary trait which predisposes toward the disease is the possession of unusually high requirements for certain food elements. These make the individual vulnerable; food as ordinarily chosen is liable not to supply enough, especially when alcohol is consumed; deficiencies result and a craving for alcohol is developed. But if the individual with this hereditary trait is able to get—by any available means—plenty of all nutritional elements he needs, then the disease does not appear, and the hereditary trait which otherwise would be damaging is completely overcome. It is as simple as that."

The author has brought together some very interesting material to support his ideas. He points out the marked variations in individual body chemistry and metabolism. Likewise, he specifies the difference in tastes which may be the result of special body physiology; mentioning salt hunger, calcium hunger, phosphate hunger, and certain specific vitamin hungers. He reports that owing to individual variations some rats are teetotalers, others like alcohol. If rats are placed on marginal diets, with a lack of B vitamins, these differences disappeared and all of them consumed a considerable amount of alcohol. When placed on high and appropriate combinations of vitamins the animals immediately stopped drinking alcohol. The dosage of vitamins, however, is different for different animals.

The author feels that this is basically what happens in cases of alcoholism in human beings and that the same type of treatment will work equally as well. He reports a series of cases that have improved under such treatment. He has a total of some 20 cases, which he agrees is not sufficient to prove his case, but he pleads for others to try out his theories and methods of treatment and see whether this does not confirm his theory. Although he does give some importance to psychological factors he maintains throughout that the essential feature is the nutritional deficiency. In striking contrast to other types of therapy employed, the author claims that his cases are able to continue to drink in moderation and not drink to excess.

The author has a simple explanation as to why there are so few Jewish alcoholics. He feels that Jews almost never have the unusual high requirements for certain nutritional elements that result in corresponding deficiencies and corresponding vulnerability to alcoholism. The author goes still further and believes that the whole problem of mental disease should be investigated by this type of approach. He cites pellagra as a perfect example

of a serious type of psychosis due to a simple niacin deficiency. With such a deficiency the individual may develop delusions, hallucinations, and require treatment for years in a mental hospital. He feels that it is quite possible that schizophrenia may have an unknown nutritional basis and that further studies along these lines may yield the methods of treating and preventing this disorder. He likewise mentions certain types of feeble-mindedness associated with a characteristic excretion of phenyl pyruvic acid in the urine. Also, he quotes the optimistic reports of some writers on the use of glutamic acid in the treatment of mental defectives. Finally, he speaks of the studies of the Worcester Institute of Biology, indicating that in schizophrenia the activity of the adrenal cortex is impaired. He feels that disorders of the endocrines may be the result of dietary inadequacies; as for example, a thyroid disorder may be due to lack of iodine in the diet.

The reviewer finds it difficult to evaluate this volume. Certainly, as a possible theory for alcoholism and for mental disease, disorders in nutrition and metabolism have occupied the interests of many of us. The reviewer would even agree that it is possible that schizophrenia is brought about primarily in the manner the author suggests. The illustrations used are likewise most interesting; however, one cannot help but feel that the author oversimplifies the problem, and in spite of the intriguing theory the reviewer finds himself somewhat pessimistic as to the results of such treatment in alcoholics. Actually, the reviewer has used this combination of vitamins in certain cases of alcoholism without any very startling results.

The book remains, however, a very interesting and stimulating volume and it is quite possible that studies along the lines indicated will yield us some extremely valuable results, not only in the treatment of alcoholism, but in the treatment of mental disease generally.

K. M. B.

PHYSICAL DIAGNOSIS. Fourth Edition. By *Ralph H. Major*. (Philadelphia: W. B. Saunders, 1951. Price: \$6.50.)

In the introduction to the first edition the author states that it is intended as a text book of physical diagnosis. That the demand for the book has necessitated a fourth edition indicates that it has been useful.

There is a real need for a concise, authoritative book on physical diagnosis that can be used by students as a guide when they are learning how to examine patients. It should emphasize the routine actions by which one gathers important facts, missing nothing, and the interpretation of these facts. As a student I learned about Kroenig's isthmus, Broadbent's sign, Grocca's triangle, Skodiak resonance, Litten's sign, etc., etc. I tried honestly for some years during my postgraduate training to decide whether or not they were of any help to me in finding out what was the matter with patients. I personally have discarded them as being of little

practical value, as have most of my contemporaries who teach physical diagnosis at the University of Toronto. I think the book would be a better book for students if it were shortened by the omission of some of this material.

The consideration of what one can learn of a person's mental state by observing their appearance and actions is interesting. It provides some needed emphasis to this aspect of physical diagnosis.

Like Dr. Major's "Classic Descriptions of Disease," this is a delightful book to read. The type is clearer than in the previous edition. The illustrations are excellent and profuse. The references to the work of the physicians who developed the art of physical diagnosis make worth-while reading.

W. F. GREENWOOD, M. D.,
Toronto, Ont.

TRENDS IN GERONTOLOGY. By *Nathan W. Shock, M.S., Ph.D.* (Stanford, Calif.: Stanford University Press, 1951. Price: \$2.50.)

This book gives figures extracted from reliable sources that show clearly the "multi-dimensional" features of the old-age problem. It tells in considerable detail what has been done or is being done in propaganda, in many community projects, in teaching and in research; and, in similar detail, what the author thinks should be done. It makes a plea for the development or expansion of courses and research in gerontology in universities and for the organization of community projects for the care and study of old people. The final recommendation is for an institute(s) of gerontology, the functions of which would be "research, teaching and service to the aged." Plans are presented for the development of such an institute in "seven stages" with the "Promotional Committee" playing a large part.

The success of one research program cited "may be indicated," the book says, "by the fact that the Governor of Minnesota, the President of the Minneapolis Honeywell Corporation, the President of General Foods and a host of other influential people from the community are included as subjects." In another project, one lecture "drew an audience of eight hundred people with approximately one hundred standees, in addition." The director of an institute of gerontology "must be endowed with infectious enthusiasm." In the teaching division "there should be courses in appreciation of music, art, literature, and science, and elementary instruction in such sciences as botany, horticulture, ornithology, and geology, as well as courses in the manual arts, such as bookbinding, metalwork, and weaving. These courses would be offered in the late afternoon and evening in order to attract members of the working community." As "much of the advance in medicine can be attributed to the young medical students who gave of their time and blood that investigations might proceed, . . . many middle-aged and elderly people must be willing to make contributions of their time, money and even of their own blood that science may progress." Blood and Science! These few excerpts reveal better the true nature of the book.

This reader has found "infectious enthusiasm" so often compounded of ignorance and cupidity that he would be sceptical of it in any director. He has found, too, that "influential" people are no less curious, credulous, or gullible regarding mind and body than are noninfluential people and, therefore, he cannot accept their participation in any project as a valid indication or measure of its merit or success. So with much in the book. He finds only the figures regarding the problem and the records of a few humane community projects and private philanthropy instructive or otherwise valuable.

There is a companion volume by the same author, "a comprehensive bibliography containing more than eighteen thousand references in English and foreign languages." The cost of the companion volume is \$15.00 in spite of the fact that it has been "published on a research grant from the Forest Park Foundation."

N. E. MCKINNON, M. D.,
University of Toronto.

PATTERNS OF SEXUAL BEHAVIOR. By *Clellan S. Ford* and *Frank A. Beach*. (New York: Harper and Brothers, 1951. Price: \$4.50.)

The authors of this book are respectively Associate Professor of Anthropology and Professor of Psychology at Yale University. They present a comprehensive study of the sexual behavior of human beings and animals, a basic source of information for scientists, physicians, and the "layman who conceives of his own life as worthy of intelligent direction and management."

In this book is a digest and comparison of the sexual patterns of human beings in 190 contemporary societies and of animals belonging to many species. The purpose is to assist in the better understanding of sexual behavior in any society. The source of information was in large part numerous books and articles found in Human Relations Area Files, Inc., formerly known as Yale's Cross-Cultural Survey.

In the first chapter the authors state that they have avoided value judgments, moral evaluations, and any discussion of the rightness or wrongness of any particular type of sexual behavior. They also have not ventured to give interpretations, which could be "much more safely attempted by the psychiatrically trained specialist." They have made a comprehensive survey of the various aspects of human and other mammalian sexual activity and they have called attention to the biological basis of this activity. Psychogenic or emotional factors are acknowledged but they are not presented in this book.

In the concluding chapter on "Human Sexual Behavior in Perspective" three general observations are made: (1) "The results of our cross-cultural analysis emphasize the important fact that the members of no one society can safely be regarded as 'representative' of the human race as a whole." (2) "Man is far from unique in his patterns of sexual behavior. Many of the behavioral items occurring in various human societies are equally characteristic

of apes, monkeys, and even lower animals. Taken together, these broadly distributed types of sexual response may be said to constitute a basic mammalian pattern. Some sexual practices are engaged in only by the human animal. Behavioral differences between man and all other animals are due to two classes of factors. The first comprises the multitude of biological changes that have occurred in the course of human evolution. The second encompasses the profound modifications that every society imposes upon the inherited tendencies of its members."

(3) "Sexual reactions are in part an expression of deep-rooted urges and needs, and the behavior through which these find expression is organized by the physical machinery of the body. The structural and functional capacities of the nervous and muscular systems determine the kinds of behavior that can occur, and, in addition, incline the individual toward certain activities and against others. The chemistry of the blood is particularly important. The presence or absence of certain glandular secretions has far-reaching effects upon the susceptibility to sexual arousal and capacity for sexual performance."

These excerpts are characteristic of the trend throughout the book. The material is well organized and the facts are clearly and concisely stated. It is a book that should prove useful to "all serious students of human behavior." Physicians and psychiatrists may find much information that has been overlooked or forgotten, information that affords a stable background for consideration of the emotional aspects of sexual behavior.

GEORGE W. HENRY, M. D.,
Greenwich, Conn.

FRONTAL LOBOTOMY AND AFFECTIVE BEHAVIOR: A NEUROPHYSIOLOGICAL ANALYSIS. By *John F. Fulton, M.D.* (New York: Norton, 1951. Price: \$3.00.)

Fulton provided Egas Moniz with the stimulus to proceed with his first attempts at the surgical treatment of mental disorders. So it is only fitting that Fulton should dedicate this small volume comprising the Salmon Lectures to Egas Moniz and Almeida Lima, who so richly expanded his own vision.

Fulton views the problem from the neurophysiological standpoint, and his preeminence in the field of neurophysiology lends both weight and authority to many of his statements. He is able to refer to much work, as yet unpublished, from his own laboratories, undertaken by his collaborators, in an effort to test various hypotheses. As a neurophysiologist, however, he is bound to consider all the angles of the problems presented, the varieties of animals used, the conflicting evidence, and the negative results. The consequence is that some confusion is inevitable. What stands out especially is the importance of the orbito-temporo-cingulo-amygdaloid complex in affective behavior.

Two major problems emerge, the first dealing with mental disorders, and the second with painful disorders. While sufficient facts have not yet been

marshalled by the various researchers, Fulton points tentatively to the cingulate operation for anxiety states and for obsessional and aggressive psychotics. "It seems clear that the depressed patient and the schizophrenic with subnormal psychomotor activity should have a resection of the posterior orbital gyrus or an interruption of its projections, while the agitated, aggressive and overactive psychotic should have either a cingulotomy or a topectomy involving areas 9 and 10. With the orbital surface lesion there is no intellectual impairment, while some degree of intellectual impairment inevitably follows upon a lesion of the lateral surface or section of its projections."

The medial ventral quadrant of the frontal lobe appears to be the critical location, and Fulton believes that operations in this area are of particular value in the control of unbearable pain.

"The implications of lobotomy are vast, for the neurosurgeon is in fact dissecting the matrix of the mind with the end in view of correcting faulty structure and interrupting vicious circles which form the basis of abnormal mental states. . . . The possibilities inherent in lobotomy for returning the mentally ill to a happier and more useful existence provide one of the most challenging problems in medicine today."

WALTER FREEMAN, M. D.,
Washington, D. C.

LEARNING THEORY AND PERSONALITY. By *O. Hobart Mowrer*. (New York: Ronald Press, 1950. Price: \$7.50.)

During the past few years there has been a growing interest in effecting a rapprochement between the psychological laboratory and the clinic. Such a rapprochement would aim to bring together theories of behavior based upon vigorous experimentation, ordinarily carried out on animal subjects, and theories built up primarily by clinical observations of persons who have come to a therapist for help.

"Learning Theory and Personality Dynamics" is a direct attempt to relate these 2 approaches and to point the way toward an integration of their findings. The author is a clinically oriented psychologist—more specifically, his orientation would probably be called psychoanalytic, though he does not go along with Freud on all issues—who has also carried on extensive research in the laboratory, especially in the area of learning. The book is made up of a collection of articles concerned with the 2 topics indicated by the title. Most of the papers have been previously published elsewhere, although a few appear here for the first time. There are 24 papers in the volume, exactly 12 coming under the first section on "Learning Theory" and the other 12 under the section on "Personality Dynamics."

Although the papers on "Learning Theory" are each separate and distinct, they follow one another in a quite logical way, showing the development of the author's theory of learning as he has gone through the steps in a series of researches. Some

are theoretical; others are detailed descriptions of experiments carried out to test a hypothesis.

Since most of these papers are somewhat technical, they would not appropriately serve as an introduction to present-day learning theory. The critical reader would undoubtedly want to become acquainted at first hand with the various other learning theories referred to.

The papers in this section are mainly interesting in showing the development of two of the author's main contributions to learning theory. One has to do with the concept of fear (or anxiety) as a drive or a goad to action, rather than a deterrent.

The other is the development and presentation of the author's two-factor theory of learning, in which it is stated that there are 2 basic learning processes. One is referred to as "solution learning," the other as "sign learning." Sign learning is essentially the same type of learning that has come to be called "conditioning," whereas solution learning is problem solving, drive reducing, and consequently gives pleasure and is related to emotional behavior. Both of these concepts are later shown to be relevant to an understanding of personality dynamics.

The papers grouped under "Personality Dynamics" seem to be more of a miscellany. They range from such topics as "An Experimental Analogue of 'Regression' with Incidental Observations on Reaction Formation" to "The Life and Work of Edgar Allan Poe—A Study in Conscience Killing." The concept of "identification" is especially stressed as "a link between learning and psychotherapy," and the book concludes with a page "On the Psychology of 'Talking Birds'—A Contribution to Language and Personality Theory," in which the process of identification is again brought out, as well as the need for more intensive studies of language if we are to understand human behavior.

The fact that the book is a collection of papers makes it difficult not only to classify and criticize, but also, in some respects, to read. The author has recognized the danger of lack of integration by providing an over-all introduction, prefatory statements to each chapter, and copious footnotes and cross references.

He recommends its use as (a) a reference work, (b) a textbook or text-supplement, (c) a guide to interdisciplinary research. The latter use would probably be of most interest to psychiatrists, for while they might not necessarily want to use it as a "guide," they would undoubtedly find it a provocative example of how our knowledge of the human personality can be advanced through interdisciplinary efforts.

JAMES G. MILLER, M. D.,
University of Chicago.

BRAIN METABOLISM AND CEREBRAL DISORDERS. By *Harold E. Himwich, M. D.* (Baltimore: The Williams and Wilkins Co., 1951. Price: \$6.00.)

Dr. Himwich has written a scholarly, lucid, and highly informative review. Since carbohydrates are the foodstuffs of the brain the early chapters review the whole subject of carbohydrate metabo-

lism in the body as related to sources of supply for cerebral activity. There are complex mechanisms for maintaining the carbohydrate supply of the brain. Oxidative processes in the brain involve the interaction of enzymes, foodstuffs, and oxygen. Aspects of the cerebral circulation in relation to brain metabolism are considered. A fascinating chapter discusses changes in cerebral metabolism during the growth period. New methods make it possible to measure the human cerebral metabolic rate.

The second portion of the book considers changes in cerebral metabolic rate related to abnormal conditions. Himwich is fascinated by Hughlings Jackson's theory of levels of function in the nervous system as demonstrated when the nutritional supply of the brain is diminished. In this connection the phenomena seen in hypoglycemia and oxygen deficiency are discussed at length. Changes in cerebral metabolic rate are found in organic diseases of the brain, such as paresis and frontal lobotomy, which cause severe damage of brain tissue. The author chooses to consider separately disorders of cerebral metabolism as related to the somatic motor and autonomic nervous systems. The final chapter deals with the influence on brain metabolism of barbiturates and other depressant drugs. There is a useful bibliography of over a thousand articles.

It will be observed that this book is concerned with fundamental chemical and physiological processes related to nervous activity. Although much of the material is familiar to most physicians, it offers a perspective that is useful in planning further basic and clinical studies. The psychiatrist who gives insulin therapy will consider this book a must.

O. R. LANGWORTHY, M.D.,
Johns Hopkins Hospital,
Baltimore, Md.

THE BENDER GESTALT TEST: Quantification and Validity for Adults. By *Gerald R. Pascal, Ph.D.*, and *Barbara Suttell, M.S.* (New York: Grune & Stratton, 1951. Price: \$6.50.)

Psychological tests must assume, for the psychiatrist at least, the status that clinical pathological procedures have for the internist: the psychiatrist must be sufficiently familiar with them to understand their basic value and limitations, and able to assign them a correct place in the total picture upon which he bases his dispositions. From this standpoint, this volume is important.

The Bender Gestalt Test consists of 9 simple geometrical designs that the patient is asked to reproduce. Originally used by Wertheimer in studies of visual perception, they were later adapted by L. Bender into a test that so far has been of limited clinical use for estimates of visual-motor maturation and effects of brain injury rather than for subtle problems of psychogenic disturbance.

However, Pascal and Suttell approach the test more ambitiously. They consider the task of reproducing the details of the stimuli primarily from the standpoint of the attitude the subject takes, and

believe that the more disturbed a person's attitude to reality is, the more he will deviate in some of the detailed features of the design production.

They supply an excellent theoretical framework for their formulations, the necessary statistical data to confirm it, and a quantitative scoring scheme for clinical use.

In conformity with some ideas expressed in a stimulating foreword by David G. Wright, the authors consider the ability to reproduce the designs a function of ego strength; therefore, the score they derive from the test is an indication of the relative severity of the ego-strength disturbance, and they appropriately find that these scores significantly differentiate normals from neurotics and the latter from psychotics.

I believe one could profitably divide psychological tests, and particularly projective tests, into those that primarily serve as quantitative indicators, that is, of the severity of a deficit state, from those that indicate the quality, content, and dynamic nature of a disorder. The TAT is an example of the latter, and Pascal and Suttell have established the Bender Gestalt Test as the former. The quantitative tests may help a psychiatrist in ordering a patient on a continuum of severity of disturbance (*e. g.*, for purpose of determining the nature of psychotherapy to be applied: supportive vs. analytic) while the content tests may enrich his knowledge of the nature of the conflicts, anxieties, etc.

The book is divided into 3 parts, with an Appendix. In the first part the theoretical setting, administration, and scoring are discussed, as well as the statistical background of the authors' validation study. They show how they arrived at the scoring of deviations in a simple, common-sense manner. Part Two consists of illustrative material in a variety of conditions and cases. A third part is constituted by the scoring manual in which the authors offer a detailed discussion of each one of the designs with the aid of excellent reproductions.

If there is any criticism of the book at all, it is that the Appendix is sandwiched in between Part Two and the Scoring Manual. The Appendix and the statistical aspects of the validation study are of little interest to clinicians and could have been more profitably placed in the last part of the book, for perusal by research workers. But aside from this minor point, this book is so well organized that it enables anyone with the proper general professional background to learn the use of the test.

The book is clear, concise, and painless to read. Psychiatrists, psychologists, and neurologists will find it helpful in practice and in teaching.

LEOPOLD BELLAK, M.D.,
New York City.

FLORENCE NIGHTINGALE. By *Cecil Woodham-Smith*. (New York: McGraw-Hill Book Co., Inc., 1951. Price: \$4.50.)

Every literate person knows about the "Lady of the Lamp" who devoted herself to the care of the soldiers of the Crimean War and transformed

nursing from a "degraded" occupation to an honored profession and a high calling.

But the Crimean experience was only an episode, although indeed a determining one, in the career of one of the most remarkable women who have adorned our planet. This book tells the full story of that life.

The reason why it is so good a biography is that it presents the living picture not only of a powerful human agency that wrought great deeds but fundamentally the picture of Florence Nightingale the woman, in her family, social, and public relations through the chapters of her dramatic life. And this has all been possible because the biographer was given access to family papers never before available, including the "private notes" in which it was Florence's habit for many years to commune with herself on paper.

The great heritage she left to mankind is owing not alone to the personal qualities of this extraordinary woman but also to the fact that she came of a family of social position and wealth. Had she been merely a daughter of the people it is at least questionable that she would have been able with all her tremendous will power to wield the influence necessary to accomplish her great work.

But the social status of the Nightingales was also a handicap. Florence's mother, a "delicate" and possessive creature, was her worst enemy. To her it was an intolerable thought that her daughter, who had great personal charm, should do other than take her place in society. Most objectionable of all was the idea that she should wish to associate herself with work in the public hospitals. In the 1840's hospitals in England were not exactly pleasant places. They did not observe the most elementary principles of cleanliness; "hospital smell" was notorious; and the manners and morals of the female attendants were not above—indeed often considerably below—reproach.

But Florence Nightingale had had a call, like Jeanne d'Arc, and at the same age of 17. As she recorded in her notes, "God spoke to me and called me to His service." Henceforth she was driven by the daemon within her, like Dorothea Dix, like Clifford Beers. Despite the anger and hostility of her mother and the hysterics of her older sister she went her own way. In this she had the support of her scholarly father who, aware of her abilities and of the domestic obstacles in her path, made her an allowance that assured her financial independence.

After spending some months in hospitals in Germany and France she returned to London, where at the age of 33, having reluctantly rejected a tempting offer of marriage and withstanding violent family scenes, she took the superintendency of the Institution for the Care of Sick Gentlewomen in Distressed Circumstances. Here her exceptional

genius for hospital organization and administration was first amply demonstrated.

At Scutari during the Crimean War, at the instance of the Secretary of War, Miss Nightingale installed, for the first time in the history of the British Army, female nurses in army hospitals. The prodigies of her labors and utter self-sacrifice during that awful time, leading eventually to collapse with "Crimean fever," are matters of epic record. Her sorest trial was official ill-treatment and antagonism. Dr. John Hall, chief of the army medical service, called her a mere adventuress. When the doctor was later given a K.C.B. she remarked that he had been dubbed "Knight of the Crimean Burial Grounds." The English who emerged with honor from the Crimean War were Florence Nightingale and her nurses and the common soldiers.

Although ill-used by army officialdom Miss Nightingale was worshipped by the British soldiers and had a friend at court, so long as his health lasted, in Sidney Herbert, Secretary of War. At home in Britain she was recognized as the unique health authority and the great and heroic character that she really was. After the war, with the £45,000 Nightingale Fund that had been collected by her admirers she founded the first training school for nurses in Great Britain. Its extraordinarily high standards—which were her own—constituted a pattern that we have since followed.

Her great concern was the welfare of the common soldier, to raise his status and the consideration in which he was held by his officers, to make vastly better provision for his health. She had assembled figures to show that the mortality in the army in peace time was double that of the civilian population. Her program meant thorough overhauling of the army medical services; it even meant radical reforms in the War Office. To these ends, in spite of her own frail health, she devoted the rest of her life with a zeal that knew no limits and a singleness of purpose that brooked no defeat. And she had the satisfaction of finding herself a recognized authority in the fields she had cultivated.

As she entered upon old age "she was treated with an almost religious deference—ministers, kings, princesses, statesmen waited at her door, and her utterances were paid the respect due to an oracle."

In the last decade of her 90 years when her eyesight had failed and activity was no longer possible for her she compensated by having read to her Theodore Roosevelt's *Sirens Life*.

Mrs. Woodham-Smith's biography of Florence Nightingale, the fruit of 6 years of intensive research, gives the fullest and truest picture that has yet been possible of one of the great figures of history.

C. B. F.

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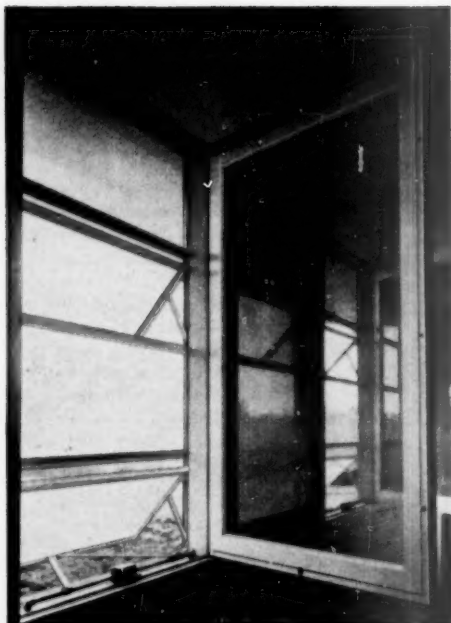
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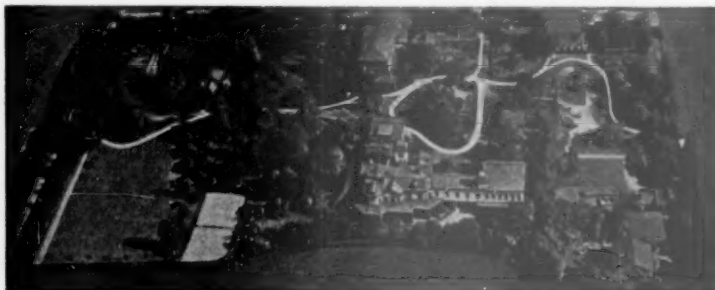
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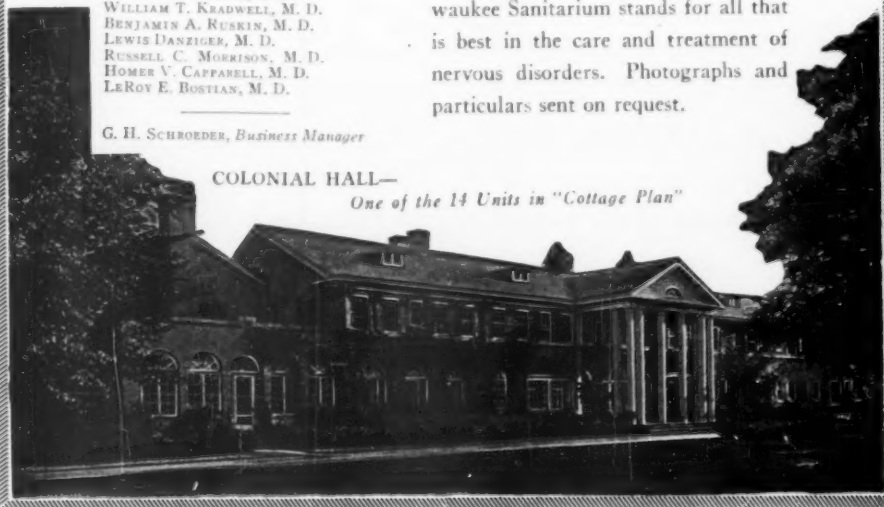
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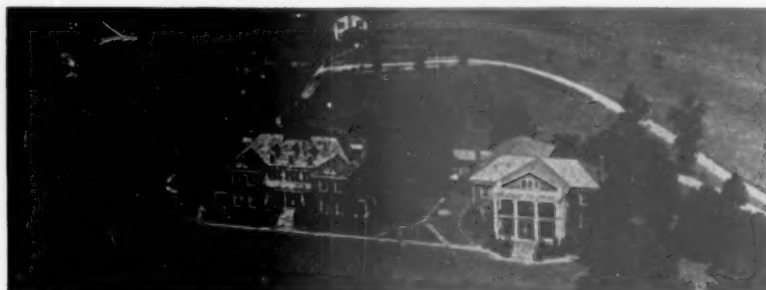
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